IBM-POUGHKEEPSIE
December 31, 1964

Diagnostic Engineering Publications

1410/7010

Subject: Diagnostic Program DC01B, DC02B, DC03B, DC04B

Sequence Number 387, 381, 385, 383
Replaces DC01A, DC02A, DC03A, DC04A

I This is a new series of diagnostic programs for the 7631-1302 when used with a 1410/7010 DPS.

II All programs in this package are compatible with "TC50".

III All programs in this package require system and channel control cards.

IV Card deck description (as punched from memory dump tape using TC50.)

DC01	7 Load cards
	1 Core clear
	161 Data cards 001-140
	1 Execute card
DC02	7 Load cards
	1 Core clear
	192 Data cards 001-183
	1 Execute card
DC03	7 Load cards
	1 Core clear
	191 Data cards 001-182
	1 Execute card
DC04	7 Load cards
	1 Core clear
	154 Data cards
	1 Execute card

Enclosures: 285 [redacted] Pages
Card Deck for CARD ONLY SYSTEMS (as punched by UP51)
Cards - Card Loader and Core Clear
Cards No. Data Cards
Card Execute Card

Distribution: 1410
7010

Other 1410/7010 Installations with 1302-7631

7631 - 1302

ADVANCED DISK FILE DIAGNOSTIC PROGRAM PACKAGE

To be used with 1410/7010 Systems

December 31, 1964

*DC01B	Home Address & Surface Test
*DC02B	1302-7631 Reliability
*DC03B	Electronic Operation
*DC04B	Mechanical Operation

*These programs replace the "A" levels.

NOTE: These programs require system and channel control cards.

December 31, 1964

7631 - 1302

PACKAGE WRITE-UP

6.21.00.0 DESCRIPTION

The programs in this package are designed to test the 7631-1302 when attached to a 1410 or 7010 system. Each program tests a specific area and together the programs make up a diagnostic package.

Program Functions

IDENT	FUNCTION
DC01A	Write HA1's Analyze Surfaces
DC02A	Reliability Test of 7631-1302
DC03A	Electronic Operation Test (7631)
DC04A	Mechanical Test (1302)

It is important to realize that these programs do overlap in scope, and this overlapping should be used to aid in determining which program to run next. Figure 1 will help in showing how the programs are to a degree inter-dependent and overlapping.

Being inter-dependent means certain programs assume correct operation of an area that is tested by another program. In this case DC03 is the only independent program, all others are dependent. This all points out the fact that the programs constitute one overall test of the 1302-7631 and understanding the general test philosophy will aid in learning the individual programs.

The package can be divided into four areas - utility, mechanical-physical, reliability, and electronic.

5.21.00.0 DESCRIPTION (continued)

Utility is covered by the portion of DC01 which prepares the 1302 for useage by writing the home addresses and insuring they are correct. This is generally only run upon installation and may never be used again unless the home addresses are destroyed.

Mechanical-Physical - This area takes into account the condition of the 1302 access mechanism and the physical condition of the disk surfaces on the 1302. DC04 performs the necessary tests on the access mechanism while DC01 analyzes* the disk surface.

Reliability - This makes a general test of the 7631-1302 as an operating device attached to the 1410-7010. DC02 is a test which should tell of trouble areas, including areas of priority and overlap.

Electronic - This area is covered by DC03 which makes a stringent test of the logic in the 7631-1302 and the lines from the 1410-7010 to the 7631. This program attempts to isolate troubles to the smallest possible area, starting with the simplest operation it builds upon the tested logic in order to test other logic.

Within each program is a set of small routines, each routine is to a large degree independent of the other routines in the program, but together the routines test one of the four areas previously described. By using this technique of breaking each program into small parts, the purpose and methods of a test should be easier understood.

* NOTE: Since the 1302 uses the Double Frequency Mode of Recording, Detection of Marginal Surface Areas becomes extremely difficult and the surface analysis is only practical as a Go-No Go Type of Test.

6.21.00.0 DESCRIPTION (continued)

If memory space were available, the entire package could be written as one program, which would certainly simplify the operating procedures, Because this is impossible, a standard operating control system has been designed which is used by all the programs. This system encompasses the following areas, and the remainder of this write-up is devoted to it.

1. Loading Procedure
2. System and Channel Control Cards
3. Standard Pre-Set TAD's (1000-1003)
4. Standard Error Typeout Format
5. Standard Program Options
6. Standard Channel Alter Routine
7. Standard Looping Methods
8. Standard Type Routine
9. Standard Restart Procedures

The standard procedures outlined here will not be repeated in the individual program write-ups since these apply for every program.

6.21.02.0 OPERATING PROCEDURES

The following operating procedures apply to all programs in this package.

02.1 SYSTEM AND CHANNEL CARDS

All the "DC" series programs use system and channel control cards to provide information about -

a. Overlap
b. Priority
c. Machine Type
d. Channels Available
e. Files Available
f. Tapes Available

These cards must be pulled from the card decks and the proper data entered according to the procedure outlined in the 1410/7010 Introductory Material. The system and channel cards in each of these program are numbered card 1, 2, 3, 4, and 5. Cards 4, and 5 apply only to a 7010 and may be discarded on a 1410.

6.21.02.0 OPERATING PROCEDURES (continued)

02.2 STANDARD TADS (1000-1003)

The standard TAD's 1000-1003 are used by all the "DC" series programs. The TAD's are pre-set to "1" when the programs are initially loaded and are changed to a "1" by the use of option 1. Definition of standard TAD's is as follows:

		Not 1	1
01000	TAD 0	Allow error typeouts	Bypass error typeouts
01001	TAD 1	Do not Req loop after error	Req loop after error
01002	TAD 2	No error halts	No error halts
01003	TAD 3	Single program pass	Repeat program

Note: In the "DC" series programs TAD 1 = 1 does not mean unconditional looping; rather it means that after an error has occurred, the program will request if the CE wants to take action. At this point, the CE may take any of the standard program options available. (These options are described later in the write-up.)

Also, TAD 2 = 1 has no meaning as there are no error halts in the "DC" series programs.

Methods for altering the TAD's are discussed later in this write-up under program options.

02.3 SPECIAL TAD's (1004-1012)

Every effort has been made to keep the special TAD's required to a minimum. When special TAD's are required, they will be preset to a 1 condition and may be altered by the CE when so desired. Refer to the individual programs for the definition of the special TAD's that it uses.

6.21.02.0 OPERATING PROCEDURES (continued)

02.4 PROGRAM CONTROL OPTIONS

Each of the "DC" programs has a standard set of control options which are available to the CE through the I/O console printer. Using the Inquiry Request Key the CE may interrupt the program and take any of the control options he desires. The following procedure is used to accomplish this.

a. Press Inquiry Request key

b. When the keyboard unlocks, enter

1) Control option code desired
2) Data required by the program to honor the request

c. Press Inquiry Release key.

Providing a legal option has been requested, the program will immediately honor the request. If the option is illegal (it does not exist), the program returns to the read console operation, a legal option must be requested.

Table 1 shows the options available, and the code and data required to request the option. See control option definitions for details of each option.

Option	Code	Data Required-Enter
End of Test	Blank	None
Alter TAD's (1000-1003)	1	Four new TAD settings desired (all 4 TAD's altered)
Alter Memory	2	Five-digit memory address to be altered
Alter Sequence of Routines	3	01, 03, 04, L Enter routine numbers separated by comma, last character is L or E
Loop a Routine	4	Five-digit starting address of routine to be looped
Loop an Instruction	5	Enter M or L, Ch Code Char, Specific File Op, W or R, BOSIO Op Code, HA1, No. of Rec's, No. of Char's/Rec, Data Char, Rec Addr.
Restart	6	Five-Digit Memory Address to start at
Continue	7	None

TABLE 1

6.21.02.0 OPERATING PROCEDURES (continued)

Definition of Control Options

Code

b. End Test - This option will terminate the test immediately unless TAD 3 = 1, in which case the program would restart from the beginning.

1. Alter TAD's - This option will alter the standard TAD's to those entered after the option code. This option will not alter any special TAD's.

2. Alter Memory - On this option the address to be altered is entered after the option code. After pressing release, the Inquiry Request is pressed again and the alteration is made. Special TAD's may be altered in this manner.

3. Alter Sequence of Routines - This option allows the CE to alter the sequence of the routines in a program. Each routine is numbered in the sequence in which they normally run, i.e., 01, 02, 03, etc., by selecting this option and entering 03, 01, 02, L, the program will run the routines in the requested sequence. A comma is entered between each routine number and the last character entered is an L or E.

   L The program loops on routine sequence entered.

   E The program returns to the program control option routine after one pass. CE now selects a new control option, i.e., continue.

   Any group of routines or all of the routines may be selected in the sequence desired.

   WARNING - Before using this option, one should be very familiar with the functions of the individual routines being selected.

4. Loop a Routine - This option causes the program to loop on the routine whose starting address was entered with the option code. When looping a routine, all error typeouts are bypassed and the loop is ended only by pressing Inquiry Request and selecting another option (probably the continue option).

6.21.02.0 OPERATING PROCEDURES (continued)

5. Loop an Instruction - Through this option the CE may cause the program to loop on any one of the five file operations with data fields of a format requested. The file operations which may be selected are:

Single Record Op
Track Record Op
Home Address Op
Track Record with Addresses
Write Format Op

Besides the control option code, the CE must enter the data required to build the one instruction loop and data field desired. This data must be entered in the following manner after the control option code.

a. M for 6 bit mode
L for 8 bit mode

b.

% - Ch 1	Unoverlap	@ - Ch 1	Overlap
- Ch 2		* - Ch 2	
? = Ch 3		$ - Ch 3	
! - Ch 4		# - Ch 4	

c. 1 for SRO
2 for TWA
5 for HAO
6 for TRO
7 for WFO

d. W for Write
R for Read

e. R Ch 1
X Ch 2
3 Ch 3
1 Ch 4

f. 9#2088 - 9#5988 File Home Address (CE tracks only)
(Enter 6 blanks for SRO)

g. 000-999 Number of Records desired.

h. 0000-5850 Number of Characters/Record

6.21.02.0 OPERATING PROCEDURES (continued)

5. i. X — Any data character desired to be used in the records. (Enter 1 or 3 for Write format.)

j. XXXXXX — Any six-digit record addr desired. This addr will be incremented by 1 for each record. (This will be the search address used for SRO.)

NOTE: When using this option the CE should be aware of the limitations on the number of records versus the number of characters. Knowledge of the existing format track or rewriting the format track (use this option) is necessary to insure valid operation. Once the program enters this loop, the Inquiry Request must be used to exit from the loop. Then another option must be selected, most likely the continue option would be selected. No errors are indicated while in this loop.

6. Restart at Desired Memory Location - This allows the CE to begin at any point in the program by entering the memory location at which the restart is desired. To restart a program from the beginning, always enter 02000.

7. Continue from Point Where Program was Interrupted - This allows the CE to cause the program to continue in a normal fashion after interrupting it for looping purposes or accidently pressing the Inquiry Request.

The program control options described here are available at anytime and should be used as much as possible for aids in trouble-shooting.

The control option "Alter Sequence of Routines" will not be available in programs which do not lend themselves to this option. Refer to individual program write-ups for this information.

In addition to the standard options, a program may have a special purpose option available; again refer to the individual program write-ups for this information.

When TAD 1=1 (request action after error), the CE may take any of the control options available by using the procedures outlined here after an error has occurred.

6.21.03.0 OPERATING HINTS

Read and understand the package write-up and program write-ups.

03.1 The alter memory option and loop a routine option could be used to alter a routine for some condition and then loop on the routine altered for troubleshooting the bug.

03.2 Several options may be selected sequentially by pressing Inquiry Request immediately after pressing Release for a selected option.

03.3 To restart a program from the beginning, use option 6 and a starting address of 02000.

03.4 The programs in this package require switch settings before the program is run. Be certain these switches are set. Refer to the program write-ups for details.

03.5 Any routine may be bypassed by altering the first instruction of the routine to an unconditional branch to the exit (or last instruction) of the routine.

6.21.04.0 PROGRAM STOPS AND RESTARTS

The following stops and restart procedures apply to all programs in this package.

04.1 ERROR HALTS

There are no program halts due to error results; TAD 2 = 1 has no meaning in this package of programs.

04.2 NORMAL HALTS

The programs may have normal halts to allow for switch settings; if so, they will be defined in the individual program write-ups.

04.3 AUTOMATIC RESTART PROCEDURE

By setting the check control switch on the console-CE-Test-Panel to Reset and Restart, the programs will automatically restart after a 1410/7010 alarm condition. This can be used to great advantage when looping a routine or instruction which is causing an alarm condition. Furthermore, this technique can be used to insure that once a program is started, it may be left unattented without fear of stopping because of alarms.

6.21.04.0 PROGRAM STOPS AND RESTARTS (continued)

04.4 MANUAL RESTART PROCEDURE

If the check control switch is not used and an alarm condition is encountered, the program can be made to continue by pressing Computer Reset and Start.

6.21.04.0 LOADING PROCEDURES

Use Standard Diagnostic Load Procedures

6.21.05.0 TYPEOUTS

The standard typeouts for all the "DC" series programs are as follows:

05.1 TITLE

The first typeout will be the five-digit program identification.

Example: DC01A

05.2 ERROR TYPEOUTS STANDARD FORMAT

a. All errors will be preceded by "ROUTINE N00."[t] This identifies the failing routine.

b. All status errors, errors indicating status condition on the I/O device, will appear in this format:

*Error 00000 M%F099999W 1248AB
1) 2) 3) 4)

1) Error flag
2) Starting address of failing routine
3) Failing instruction
4) Status indicator that was on

1	Not ready
2	Busy
4	Data Check
8	Ext. Cond.
A	No transfer
B	Wrong length record

t A routine/error index is available in each program write-up to aid in locating an error in the program listing.

6.21.05.0 TYPEOUTS (continued)

05.2 c. All program detected errors, errors for which the computer does not give an indication of error, will appear in the following format. Refer to program listing for explanation of error.

```
*Error     01  02      00000
  1)        2)          3)
```

1) Error flag
2) Error(s) detected during routines
3) Starting address of failing routine

d. Combinations of status errors and program detected errors will appear in this format:

```
*Error   01   00000   M%F099999W      1248AB
```

e. Any data which may be pertinent to the error, i.e., file address, may appear as the third line of the error message. This is not standard and will be given only as required. (See individual program write-ups.)

f. If TAD 1 = 1 (request loop after error), the following will appear; it will be the last line of the error message.

```
REQ ERROR ACTION
```

g. The maximum error message would look like this:

```
ROUTINE N00
*Error 01  00000   M%F099999W      1248AB
PERTINENT DATA
REQ ERROR ACTION
```

05.3 SUMMARY TYPEOUTS

Program which may be run in a reliability mode for long periods of time will give a summary of errors. This summary will be given when:

a. A specific error has occurred ten times
b. The test is terminated.

6.21.05.0 TYPEOUTS (continued)

In the case where a specific error has occurred ten times, the following is typed:

"ERR00 COUNT 10"

The program continues automatically after this typeout.

b. When the program is terminated (manually or by the program itself), a complete summary of errors is typed.

```
"ERROR COUNT"
"00        6"
"01        4"
"07        3"
etc.

"NR  BY  DC  EC  NT  WLR"
" 0   3   1   6   0   12"
```

The first table indicates the number of times a program detected error occurred. This total should be added to the " 10 COUNT" typeouts for any specific error.

The second table is the number of times any of the status indicators were found to be on.

NOTE: The summary is given whether or not TAD 0 is set to 1. This allows normal error typeouts to be bypassed without a loss of information. Refer to the individual programs for information on the availability of the summary typeout.

05.4 END OF TEST MESSAGE

When the program is complete or has been terminated, the word "PASS" is typed out before transferring to the load program.

NOTE: All messages are given on the typewriter.

6.22.00.0 DC01 HOME ADDRESS AND SURFACE TEST DESCRIPTION

This program is made up of 5 tests which may be run in 1 of 4 modes, giving a total of 20 variations. The tests which may be run are:

a. Write home addresses and verify addresses
b. Verify addresses
c. Analyze surfaces
d. Write addr, verify addresses, and analyze surfaces
e. Analyze surfaces and verify addresses

The modes in which these tests may be run are:

a. Entire module - 1 Access
b. One cylinder
c. One surface
d. One track

There is actually one other selection which may be made, this is for flagging a defective track. The flagging routine is available as a program option and would usually be selected only when the surface analysis test has determined that a track is defective.

It is important to remember that the surface analysis and write home address tests will destroy any data on the tracks being tested. This also includes the format track for the cylinder in which the tested tracks are located. The verify addresses test does not destroy any data that may be on the file.

6.22.01.0 OPERATING PROCEDURE

The standard procedures outlined in the package description apply to this program, in addition the following procedures are used to run this program.

01.1 SWITCH SETTINGS PREVIOUS TO RUNNING PROG.

a. HAO Switch ON (On every 7631 to be used)
b. All 1302 accesses not to be tested are set inoperative.
c. All other 7631-1302 switches OFF.

CAUTION: THIS PROGRAM CAN DESTROY CUSTOMER DATA AND/OR FORMATS.

6.22.01.0 OPERATING PROCEDURES (continued)

01.2 SPECIAL REQUESTS

A. "Turn On HAO & CE-WRT SW" (CE turns on these switches)

B. "Tsting ACC x Mod x Ch x" (If the module number access addr, and channel are correct, the CE should enter a 1. If it is not a module and access which is to be tested, a 1 (any character other than 1) is entered and another module and access are selected.)

"Sel Mode" (CE enters on the typewriter one of 20 mode-test variations plus the four digit HA 1 at which the program should start operating.)

ex. 10250

- Mode-Test, write HA1's on the entire module
- Start test at HA1 0250

Note: Reference Operating Hints for rules of selecting modes and starting HA1 address.

The Codes for the 20 Mode-Test Variations

TEST	ENTIRE MOD 1 Access	MODE 1 Cyl.	One Track	One Surface
Write HA1's and verify addr's	1	A	J	/
Verify addr's	2	B	K	S
Analyze surfaces	3	C	L	T
Write HA1's, analyze surfaces and verify addr.	4	D	M	U
Analyze surfaces and verify addr.	5	E	N	V

C. "You have selected to operate on customer tracks, this can result in the loss of customer data. The starting address selected is xxxx. Enter ## *6. If this is correct." (This is a safety check, CE enters something other than ## *6 if selection is incorrect.)

FORMAT KEY FOR WRITE HA'S ETC 1-0000 (ENTIRE ACC)

6.22.01.0 OPERATING PROCEDURE (continued)

01.2 SPECIAL REQUESTS (cont'd)

D. "Turn on Format Sw for Acc & Mod Being Tested"
This request is followed by a halt so that the switch on the appropriate 1302 may be turned on. Press Start to continue.

E. "Select Patterns, Enter 1 To Use V & I, 2 To Use V, 3 To Use I"
(CE selects types of patterns to be used for surface analysis).

F. "CE-HAO ON"
This request is followed by a halt so that the switch on the 7631 may be turned on. Press start to continue.

G. "CE-HAO OFF"
This request is followed by a halt so that the switch on the 7631 may be turned off. Press start to continue.

H. "Selection Error, Safety Interlock Causes Restart"
(If the CE has not selected the starting address correctly, this message is typed out and the program restarts.)

01.3 SPECIAL TADS

There is one special TAD for this program (Memory Location 01004.)

If this TAD is set to a 1, the verify address test will cause all failing addresses to be read from the file and displayed on the typewriter. This TAD is set to 1 when the program is loaded.

01.4 PROCEDURE TO FLAG-A-TRACK

In order to Flag-A-Track, the following procedure should be used:

A. Load DC01
B. When the select mode request is made, enter 20000
C. When the program begins to operate on the file (verify addresses), Press Inquiry Request.

6.22.01.0 OPERATING PROCEDURE (continued)

01.4 PROCEDURE TO FLAG-A-TRACK (cont'd)

D. When the request is honored, enter 8 xxxx Y
   - Flag-A-Track option code
   - HA1 of track to be flagged
   - Flag character to be used

E. Press release and the program will flag the track selected.

F. "TRK Flgd OK" (This message indicates a successful flagging operation, the CE must now select another option, or reselect the flagging routine.)

01.5 STANDARD OPTIONS NOT AVAILABLE IN THIS PROGRAM

Alter routine sequence - Code 3.

6.22.02.0 OPERATING HINTS

02.1 TIMING CONSIDERATIONS

When operating in the "entire module" mode, the program requires rather large amounts of time. The following were timed on a 1410, with accelerator feature, running the entire module:

A.	Write addresses	35 minutes } 1 ACCESS
B.	Verify addresses	15 minutes }
C.	Analyze surface	61 minutes
D.	Write addresses and analyze surfaces	106 minutes
E.	Analyze surfaces and verify addresses	67 minutes

6.22.02.0 OPERATING HINTS (continued)

02.2 CYLINDER MODE

When running in the cylinder mode, the HA1 entered must be for the lowest track in the cylinder to be tested.

02.3 ONE SURFACE

When this mode is selected, the HA1 of the outermost track of the surface to be tested is entered. If the fourth surface is to be tested, HA1 0004 would be entered.

02.4 ENTIRE MODULE - 1 ACCESS MODE

When this mode is selected, the first HA1 in the first cylinder to be tested is entered. The program need not start at cylinder 000, it may start at any cylinder.

02.5 ALTER SPECIAL TAD

Use program option code 2 (alter memory) to alter the special TAD to a 1 or 1. Special TAD location is 01004.

6.22.03.0 PROGRAM STOPS

03.1 ERROR STOPS

None

03.2 NORMAL STOPS

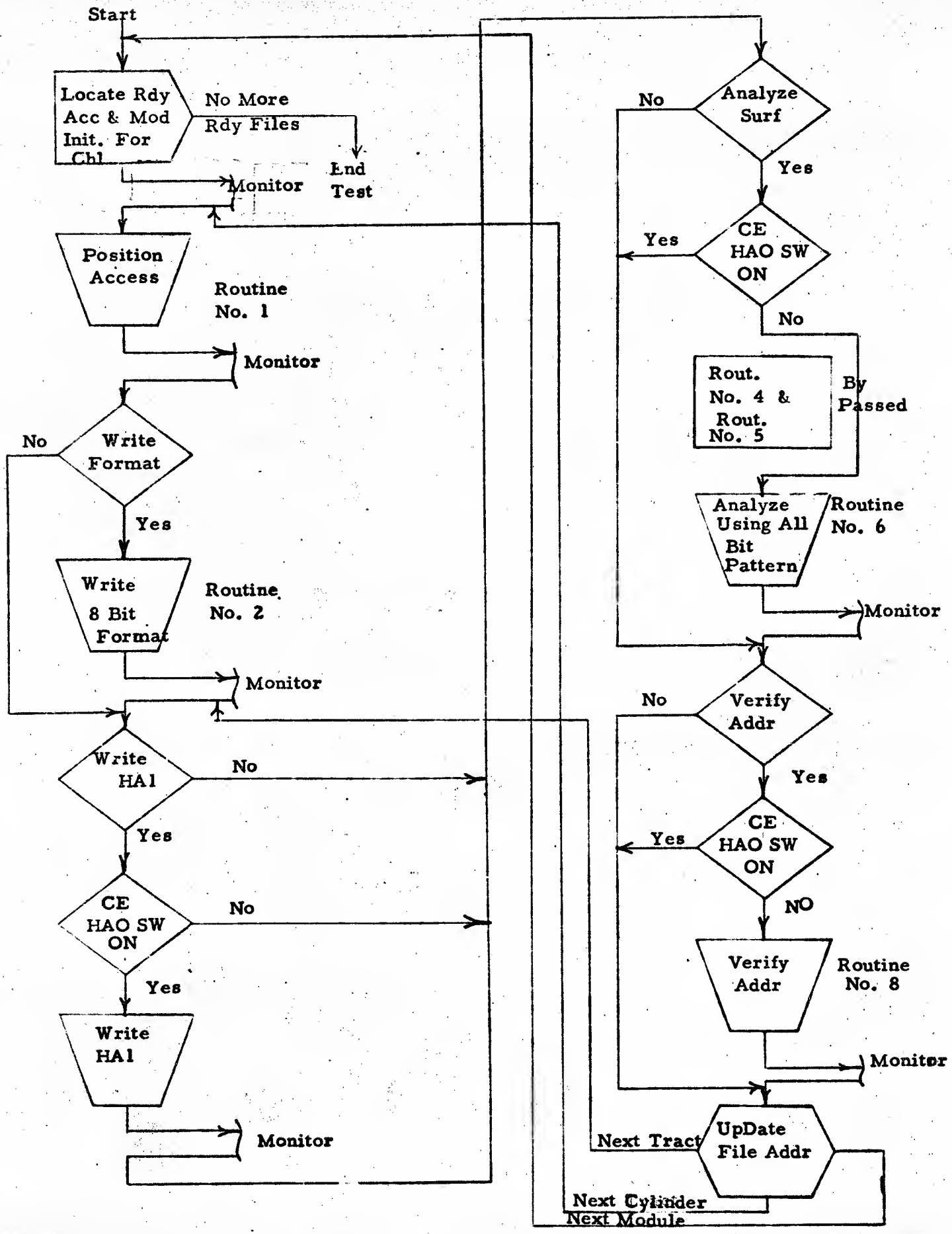
Mem Loc	Reason
04070	Wait for Format to be turned on.
06093	Wait for CE-HAO to be turned off, press Start.
06131	Wait for CE-HAO to be turned on, press Start.
	Test is completed, press Start to go to loader.

6.22.04.0 TYPEOUTS (Other than Request or Standard Typeouts)

Following the standard error message will be the eight-digit file address being used at the time of the error. This will be the third line of the error message.

6.22.05.0 FLOW CHART

The following flow chart is designed to give a general picture of the test routine's relationship to one another.


Start
Locate Rdy Acc & Mod Init. For Chl
No More Rdy Files
End Test
Monitor
Position Access
Routine No. 1
Monitor
No
Write Format
Yes
Write 8 Bit Format
Routine No. 2
Monitor
Write HA1
No
Yes
CE HAO SW ON
No
Yes
Write HA1
Monitor
No
Analyze Surf
Yes
Yes
CE HAO SW ON
No
Rout. No. 4 & Rout. No. 5
By Passed
Analyze Using All Bit Pattern
Routine No. 6
Monitor
No
Verify Addr
Yes
Yes
CE HAO SW ON
NO
Verify Addr
Routine No. 8
Monitor
Next Tract
UpDate File Addr
Next Cylinder
Next Module

6.22.06.0 ROUTINE/ERROR INDEX DC01

To locate routines and errors in the program listing.

```
PGLIN     LABEL     OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION

1002                LCAD
1003                CTL    2
1004
1005                DEFINE STANDARD TADS
1006                **
1007                *
1008      TAD0      CCW    a a                            01000
1009      TAD1             a a                         1  01000
1010      TAD2             a a                         1  01001
1011      TAD3             a a                         1  01002
1012                                                    1  01003
1013                DEFINE SPECIAL TADS
1014                **
1015      SPTAD0    CCW    a a                         1  01004
1016      SPTAD1           a a                         1  01005
1017      SPTAD2           a a                         1  01006
1018      SPTAD3           a a                         1  01007
1019      SPTAD4           a a                         1  01008
1020      SPTAD5           a a                         1  01009
1021      SPTAD7           a a                         1  01010
1022      SPTAD8           a a                         1  01011
1023      SPTAD9           a a                         1  01012
1024
```

```
PGLIN     LABEL     OPCOD  OPERAND                  CT  ADDRS  INSTRUCTION

1026                  *** I/O DICOST PROGRAM ***
1027                *** CNE INSTRUCTION LOOP ROUTINE ***
1028          . WHEN THE CE SELECTS A CNE INSTRUCTION LOOP THE I/O INSTRUCTION
1029         . IN THIS ROUTINE IS ALTERED AND THE LOOP IS ENTERED.NOTE THAT THE
1030          BRANCH ON INQUIRY INSTRUCTION IS THE ONLY EXIT FROM THE LOOP.
1031     LOOP       MC    %11,C,R          I/O INST BEING LOP E   10  01013  M %11 00000 R
1032                BAI   *61                                     7  01023  R 01030 M
1033                BNQ   PRGCTL           BRCH ON INQ TO PRGCL   7  01030  J 02273 Q
1034                B     LOOP             CONTINUE TO LOOP       7  01037  J 01013
1035                H                                             1  01044  .
1036
```

```
1038                    *** I/C CICOST PROGRAM ***
1039                  *** CHANNEL ALTER ROUTINE ***
1040          THIS RCUTINE ALTERS ALL I/O INSTRUCTICNS,BRANCH-CN-STATUS-
1041        INDICATCR-CN INSTRLCTICNS,AND BRANCH CN CHANNEL OVERLAP IN PRO-
1042        CESS INSTRLCTICNS ACCORDING TC THE CHANNEL INCICATEC.THIS IS DONE
1043        BY SCANNING A DEFINED AREA CF MEMORY AND ALTERING THESE INSTRUC-
1044        TICNS.
1045
1046    CHALTR  SER     X5              STORE ACDR                      7 01045 G 00049 B
1047            MLCA    9&X5,X7         LOAC 1X6 & 1X7                 12 01052 D 00*+9 00059 I S
1048    SCAN    SCNLA   0&X6,0&X6       SCAN FCR WP                    12 01064 D 00*.0 00*.0 B
1049            SAR     X6              STORE ACDR CF CPER              7 01076 G 00054 A
1050            C       X6,X7           HAS ALL CF FLD BEEN            11 01083 C 00054 00059
1051            BH      13&X5           SEARCHED IF SO BRCH             7 01094 J 00*/3 U
1052            MLCS    1&X6,*&12       STORE CP CCCE                  12 01101 D 00*.1 01124 3
1053            BCE     MLCRU,CCCES,    IS CP CCDE M                   12 01113 B 01149 02598
1054            BCE                     IS CP CCDE L                    1 01125 B
1055            BCE                     IS CP CCDE L                    1 01126 B
1056            BCE     RX3CR1          IS CP CCCE R                    6 01127 B 01168
1057            BCE                     IS CP CCDE X                    1 01133 B
1058            BCE                     IS CP CCCE 3                    1 01134 B
1059            BCE                     IS CP CCCE 1                    1 01135 B
1060            BCE     JAY             IS CP CCDE J                    6 01136 B 01187
1061            B       SCAN            GO FINC NEXT OPER               7 01142 J 01064
1062    MLCRU   MLCS    10&X5,2&X6      CHEANGE CH-MCDE CHAR           12 01149 D 00*/0 00*.2 3
1063            B       SCAN            GO FINC NEXT OPER               7 01161 J 01064
1064    RX3CR1  MLCS    11&X5,1&X6      CHANGE B-I-S-I-C CP            12 01168 D 00*/1 00*.1 3
1065            B       SCAN            GO FINC NEXT OPER               7 01180 J 01064
1066    JAY     MLCS    7&X6,*&12       STORE MCDIFIER                 12 01187 D 00*.7 01210 3
1067            BCE     ONE234,MCDS,    IS MCDIFIER A 1                12 01199 B 01221 02602
1068            BCE                     IS MCDIFIER A 2                 1 01211 B
1069            BCE                     IS MCDIFIER A 3                 1 01212 B
1070            BCE                     IS MCDIFIER A 4                 1 01213 B
1071            B       SCAN            GO FINC NEXT OPER               7 01214 J 01064
1072    ONE234  MLCS    12&X5,7&X6      CHANGE BCL MCDIFIER            12 01221 D 00*/2 00*.7 3
1073            B       SCAN            GO FINC NEXT OPER               7 01233 J 01064
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1074                H                                                        1  01240  .
1075
1076
1077                DEFINE SYSTEM & CHANNEL CONTROL CARDS
1078
1079                CRG    1233                                                    01233
1080                CCW    @FP6FML6MTFMC3E7/5@                               17  01249
1081                                                    **
1082                DEFINE PROGRAM TITLE
1083                                                    **
1084                CRG    125C                                                    01250
1085                CCW    @DCC18@,G          DC01                            5  01254
1086
1087                LOCATE THE SYSTEM & CHANNEL CARDS
1088
1089                CRG    1256                                                    01256
1090      SYSTEM    CC     @                                          @       50  01256
1091                       @      @                                               7  01312
1092                CRG    1289                                                    01289
1093      CHNL1     CC     @                                          @       50  01289
1094                       @      @                                               7  01345
1095                CRG    1346                                                    01346
1096      CHNL2     CC     @                                          @       50  01346
1097                       @      @                                               7  01402
1098                CRG    14C3                                                    01403
1099      CHNL3     CC     @                                          @       50  01403
1100                       @      @                                               7  01459
1101                CRG    1460                                                    01460
1102      CHNL4     CC     @                                          @       50  01460
1103                       @      @                                               7  01516
1104
```

```
PGLIN   LABEL    OPCOD  OPERAND
1106                 *** I/O DIOST PROGRAM ***
1107               *** TYPE AND REQUEST FOR INTERVENTION ***
1108          THIS ROUTINE IS USED TO TYPE ALL MESSAGES AND REQUESTS FOR
1109        MANUAL INTERVENTION.THE ROUTINE WILL TYPE A MESSAGE FROM A COMMON
1110        DATA FIELD,OR THE MESSAGE MAY BE LOCATED IMMEDIATELY AFTER THE
1111        BRANCH INSTRUCTION TO THIS ROUTINE.IF A REPLY IS REQUIRED A READ
1112        CONSOLE PRINTER OPERATION IS ISSUED.THIS ROUTINE IS USED TO TYPE
1113        ALL MESSAGES IN THIS PROGRAM.
1114
1115     TYMES    SBR    TYPXIT&S      STORE RETURN ADDR
1116     TYPE     WCP    201           TYPE MESSAGE
1117              BEX1   *-16,M S      BRCH ON ANY BUT WLR
1118              BA1    *&1
1119     SW11     NOPWM
1120     LAB60    RCP    0             READ CONSOLE PRINTER
1121              BEXT   *-16,M S      BRCH ON ANY BUT WLR
1122              BA1    *&1
1123              CW     SW11&1        TURN OFF SWITCH 11
1124              CS     33C           CLEAR PRINT AREA
1125              CS
1126     TYPXIT   B      0             RETURN TO DIOST
1127     TYP1     SBR    X1            STORE ADDR OF MESG
1128              B      *&14
1129     TYP2     SBR    X1            STORE ADDR OF MESG
1130              SW     REPLY&1       TURN ON REPLY SW
1131              WCP    O&X1          TYPE MESSAGE
1132              SBR    X5            SAVE ADDRESS
1133              BEX1   *-23,M S      BRCH ON ANY BUT WLR
1134              BA1    *&1
1135     REPLY    NOPWM                BRCH
1136              B      RDCCN         IF REPLY REQUIRED
1137              B      O&X5          RETURN
1138     RDCCN    RCP    O&X5          REPLY TO MSG
1139              SBR    X1            SAVE ADDR
1140              BEX1   *-23,M S      BRCH ON ANY BUT WLR
```

```
CT  ADDRS  INSTRUCTION
 7  01517  G 01591 B
10  01524  M ZTO 0C201 M
 7  01534  R 01524 BSMGM
 7  01541  R 01548 M
 1  01548  N
10  01549  M ZTO 00000 R
 7  01559  R 01549 BSMGM
 7  01566  R 01573 M
 6  01573  D 01549
 6  01579  / 0C330
 1  01585  /
 7  01586  J 000CC
 7  01593  G 00029 B
 7  01600  J 01620
 7  01607  G 00029 B
 6  01614  , 01652
10  01620  M ZTO 000#0 M
 7  01630  G 00049 BSMGM
 7  01637  R 01620 M
 7  01644  R 01651 M
 1  01651  N
 7  01652  J 01666
 7  01659  J 0C##0
10  01666  M ZTO 00##0 R
 7  01676  G 00029 BSM
 7  01683  R 01666 M
```

```
PGLIN     LABEL     OPCOD  OPERANC                                  CT  ADDRS  INSTRUCTION
1141                BAL    *&1                                       7  01690  R 01697 GM
1142                CW     REPLY&1                                   6  01697  B 01652
1143                B      O&X1                                      7  01703  J 000*0
1144      CATA      MLCWS  @N&,PASS1                                12  01710  D 08965 01944 7
1145                BCE    *&13,1264,1                              12  01722  B 01746 01264 1
1146                MLCWS  @N&,MCNITR67                             12  01734  D 08965 02108 7
1147                MRCWG  *&9,1230                                 12  01746  D 01766 01230 CL
1148                B      PASS167                                   7  01758  J 01951
1149                H                                                1  01765  .
1150                DC     @.73&                                     3  01768
1151                DCW    @J&                                       1  01769
1152                DC     SCAN                                      5  01774  01064
1153                DC     @ @                                       1  01775
1154                DCW    @.@,G                                     1  01776
1155
1156                *** ERROR TABLES THESE ARE USED FOR ERROR ***
1157                *** SUMMARIES AND ERROR INDENTIFICATION ***
1158.
1159                CRG    *&XCC                                        01800
1160                CRG    *&1                                          01801
1161      STPTAB    DCW    @LC@                                      1  01801
1162      E1        DC     @ @                                       1  01802
1163      E2                @ @                                       1  01803
1164      E3                @ @                                       1  01804
1165      E4                @ @                                       1  01805
1166      E5                @ @                                       1  01806
1167      E6                @ @                                       1  01807
1168      E7                @ @                                       1  01808
1169      E8                @ @                                       1  01809
1170      E9                @ @                                       1  01810
1171      E10               @ @                                       1  01811
1172      E11               @ @                                       1  01812
1173      E12               @ @                                       1  01813
1174      E13               @ @                                       1  01814
1175      E14               @ @                                       1  01815
1176      E15       DC      @ @                                       1  01816
```

PGLIN	LABEL	I/O DICOST TYPE CPCCD	OPERANC	CT	ADDRS	INSTRUCTION
1177	E16		@ á	1	01817	
1178	E17		@ á	1	01818	
1179	E18		@ á	1	01819	
1180	E19		@ á	1	01820	
1181	E20		@ á	1	01821	
1182	E21		@ á	1	01822	
1183	E22		@ á	1	01823	
1184	E23		@ á	1	01824	
1185	E24		@ á	1	01825	
1186	E25	DC	@ á	1	01826	
1187	E26	DC	@ á	1	01827	
1188	E27		@ á	1	01828	
1189	E28		@ á	1	01829	
119C	E29		@ á	1	01830	
1191	E30		@ á	1	01831	
1192	E31		@ á	1	01832	
1193	E32		@ á	1	01833	
1194	E33		@ á	1	01834	
1195	E34		@ á	1	01835	
1196	E35		@ á	1	01836	
1197	E36		@ á	1	01837	
1198	E37		@ á	1	01838	
[illegible]	E38		@ á	1	01839	
12C0	E39		@ á	1	01840	
12C1	E40		@ á	1	01841	
12C2	E41		@ á	1	01842	
12C3	E42		@ á	1	01843	
12C4	E43		@ á	1	01844	
12C5	E44		@ á	1	01845	
12C6	E45		@ á	1	01846	
12C7	E46		@ á	1	01847	
12C8	E47		@ á	1	01848	
12C9	E48		@ á	1	01849	
1210	E49		@ á	1	01850	
1211	E50		@ á	1	01851	
1212	E51	DC	@ á	1	01852	

PGLIN	LABEL	I/C	DICOST TYPE OPERAND	CT	ADDRS	INSTRUCTION
1213	E52		a a	1	01853	
1214	E53		a a	1	01854	
1215	E54		a a	1	01855	
1216	E55		a a	1	01856	
1217	E56		a a	1	01857	
1218	ERRTAB	CC	a+a	1	01858	
1219		CC	a a	1	01859	
1220						

```
PGLIN     LABEL     CPCCD  OPERANC                                  CT  ADDRS  INSTRUCTION
1222                *** INITIALIZE ROUTINE FOR THE DICOST PROGRAM ***
1223      INITLE    WCP    1250              PRINT TITLE            10  01860  M %TO 01250 W
1224                BCBI   *-16                                      7  01870  R 01860 2
1225                BAI    *&1                                      7  01877  R 01884 M
1226                CS     99                RESET IND REG 5        6  01884  / 00099
1227                Sw     25                SET WM IN IND REG 1    6  01890  , 00025
1228                MLCS   a**a,10C          PREPARE TO LOAD 2-15  12  01896  D 08966 00100 3
1229                MRWR   25,30             LOAD IND REG 2-15     12  01908  D 00025 00030 3
1230                MRCWG  RESUME,1          MOVE RESET PROCEDURE  12  01920  D 02015 00001 L
1231                MRCWG  INTR,1C1          MOVE INTERUPT PROC    12  01932  D 02007 00101 L
1232      PASS1     B      DATA              GO DO  MORE INITIALIZING  7  01944  J 01710
1233                CW     LPRT,SW1161                             11  01951  ¤ 02610 01549
1234                CS     E5&               CLEAR AND RESET        6  01962  / 01857
1235                MLCWS  aLa,STPTAB         ERROR TABLE           12  01968  D 08967 01801 7
1236                B      START             GO TO ROUTINE INIT.    7  01980  J 0345C
1237
1238                H                                               1  01987  .
1239                CRG    2CC0                                        02000
1240                B      INITLE                                   7  02000  J 01860
1241                *** RESET & INTERUPT ROUTINES,THESE ROUTINES ***
1242                *** ARE MOVED TO LOCATIONS 1 & 1C1
1243      INTR      BNC    PROCTL            RETURN TO PROG CNTRL   7  02007  J 02273 Q
1244                CCW    aMa                                      1  02014
1245      RESUME    B      CKLUP                                    7  02015  J 02023
1246                CCW    aMa                                      1  02022
1247      CKLUP     Bw     MONITR,LPRT       CHECK FOR LOOP ROUT   12  02023  V 02101 02610 1
1248                Bw     LOOP,LPINST       CHECK INST LOOP SW    12  02035  V 01013 02611 1
1249                CW     SW1161,EXTRA61    CLEAR TYPE & ERROR SWITCHES  11  02047  ¤ 01549 03017
1250                CW     REPLY&1                                  6  02058  ¤ 01652
1251                CS     E5&               CLEAR ERROR TABLE      6  02064  / 01857
1252                MLCWS  aLa,STPTAB                              12  02070  D 08967 01801 7
1253                MLNA   X3,X2             LOAD IX 2             12  02082  D 00039 00034 /
1254                B      MONITR67          GO TO MONITR           7  02094  J 02108
1255
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ACCRS  INSTRUCTION

1257                   *** I/O DICOST PROGRAM ***
1258                ***       MONITOR ROUTINE       ***
1259          THE MONITOR IS ENTERED AFTER EVERY TEST ROUTINE IS COMPLETED,OR
1260        A STATUS ERROR HAS BEEN DETECTED AND INDICATED.IN THE CASE OF A
1261        STATUS ERROR MONITOR SIMPLY BRANCHES BACK TO THE POINT AT WHICH
1262        THE STATUS ERROR WAS DETECTED.WHEN ENTERED FROM THE END OF A
1263        TEST ROUTINE MONITOR CHECKS TO SEE IF THE GE PRESSED INQUIRY,THE
1264        ROUTINE IS BEING LOOPED,ANY ERRORS OCCURED,ALTER ROUTINE SEQUENCE
1265        IS SELECTED,OR THE NEXT SEQUENCIAL ROUTINE SHOULD BE RUN.
1266
1267     MONITR    SBR    X2              STORE ADDR               7  02101  G 00034 0
1268               BXPA   *&1             EXIT ALERT MODE          7  02108  Y 02115 X
1269               BNC    PROCTL          WAS THERE AN INC         7  02115  J 02273 Q
1270     MONIT1    B      0&X3,LPRT       RETURN IF LOOPING RT    12  02122  V 0D0P0 02610 1
1271     MONIT2    MLCWS  3M3,224         SET WMGM SHORT MESG     12  02134  D 08968 00224 7
1272               B      ERROTL                                   7  02146  J 02670
1273     MONIT3    NOP                                             1  02153  N
1274               MLCWA  X2,X3           LOAD IX3                12  02154  D 00034 00039 X
1275               MLCWS  3 6,224         CLEAR WMGM              12  02166  D 08969 00224 7
1276               B      0&X2            GO TO NEXT ROUTINE       7  02178  J 000.0
1277     WHERE2    MLCWS  *-12,224        CLEAR WMGM              12  02185  D 02184 00224 7
1278               BCE    *&8,0&X2,N      BRCH IF ROUT COMP       12  02197  B 02216 000.0 N
1279               B      0&X2            RETURN TO ROUTINE        7  02209  J 000.0
1280               BZN    *&8,1&X2,2      BRCH IF CHAR IS NUMR    12  02216  V 02235 000.1 2
1281               B      0&X2            RETURN TO ROUTINE        7  02228  J 000.0
1282               BZN    *&8,2&X2,2      BRCH IF CHAR IS NUMR    12  02235  V 02254 000.2 2
1283               B      0&X2            RETURN TO ROUTINE        7  02247  J 000.0
1284               B&     MONIT3,3&X2     BRCH IF CHAR HAS &M     12  02254  V 02153 000.3 1
1285               B      0&X2            RETURN TO ROUTINE        7  02266  J 000.0
1286
```

```
PGLIN  LABEL    OPCOD  OPERAND                  CT  ADDRS  INSTRUCTION
1288                   *** I/O DICOST PROGRAM ***
1289               ***      PROGRAM CONTROL      ***
1290        WHEN THE CE PRESSES INQUIRY TO SELECT A STANDARD PROGRAM OPTION
1291      THIS ROUTINE IS ENTERED.THE CE ENTERS ON THE TYPEWRITER THE
1292      OPTION CODE DESIRED,ALONG WITH THE DATA NEEDED BY THE OPTION.THE
1293      ROUTINE DETERMINES WHICH OPTION HAS BEEN SELECTED AND INITIATES
1294      THE OPTION..
1295
1296  PRGCTL    RCPW   CTLFLD           READ THE CONSOLE PRT      10  02273  L 8TO 00201 R
1297            SER    X1                                         7  02283  G 00029 B
1298            BEXI   PRGCTL,M S      BRCH ON ANY BUT WLR        7  02290  R 02273 SM
1299            SW     CTLFLD&1                                   6  02297  , 00202
1300            BAI    *&1                                        7  02303  R 02310 GM
1301            CW     LPRT,LPINST     TURN OFF LOOP SW'S        11  02310  ¤ 02610 02611
1302            MLWS   *,E1            CLEAR WM IN ERROR         12  02321  D 02332 01802 4
1303            MWWR   E1,E2             TABLE                   12  02333  D 01802 01803 2
1304            MLCS   CTLFLD,*&12     MOVE CTL CODE ENTERD      12  02345  D 00201 02368 3
1305            BCE    ENDTST,CTLCOD,  IS CTL CODE BLANK         12  02357  D 08742 02609
1306            BCE    ALTADS          IS CTL CODE 1              6  02369  B 02424
1307            BCE    ALTMEM          IS CTL CODE 2              6  02375  B 02447
1308            BCE    LUPRT           IS CTL CODE 4              6  02381  B 02494
1309            BCE    ONELUP          IS CTL CODE 5              6  02387  B 02523
1310            BCE    RSTART          IS CTL CODE 6              6  02393  B 02557
1311            BCE    CONT            IS CTL CODE 7              6  02399  B 02580
1312            BCE    NIC,CTLFLD,8    BRCH TO FLAG ROUTINE      12  02405  B 07201 00201 8
1313            B      PRGCTL                                     7  02417  J 02273
1314  ALTADS    MLCA   CTLFLD&4,1003   MOVE IN NEW TADS          12  02424  D 00205 01003 1
1315            CS     MONIT1,299      CLEAR OUT CTL FLD         11  02436  / 02122 00299
1316  ALTMEM    MLCA   CTLFLD&5,*&9    MOVE ADDR TO BE ALTR      12  02447  D 00206 02467 1
1317            RCPW   0               ALTER MEMORY              10  02459  L 8TO 00000 R
1318            BEXI   *-16,M S        CHECK ALL BUT WLR          7  02469  R 02459 SMG
1319            BAI    *&1                                        7  02476  R 02483 GM
1320            CS     MONIT1,299      CLEAR THE CNTRL FLD       11  02483  / 02122 00299
1321  LUPRT     SW     LPRT            TURN ON LOOP SWITCH        6  02494  , 02610
1322            MLNA   CTLFLD&5,X2     LOAD IND REG2             12  02500  D 00206 00034 /
```

```
                    I/O DICOST PROGRAM CONTROL
PGLIN    LABEL      OPCCD  OPERAND
1323                CS     MONIT2,299          CLEAR CNTRL FLD
1324     CALLUP     SW     LPINST              TURN ON LOOP INST SW
1325     LUPINT     NOPWM                      THIS SW IS TURNED ON
1326                B      *88                    BY ERRCTL
1327                B      PREP                GO TO PREPARE ROUT
1328                CW     LUPINT&1            TURN OFF SW
1329                B      LOOP
1330     RSTART     PLNA   CTLFLD65,X2         LOAD IND REG2
1331                CS     MONIT2,299          CLEAR CNTRL FLD
1332     CONT       CS     WHERE2,299          CLR CNTL FLD
1333
1334                I/O DICOST CONSTANTS
1335     CODES      CCW    @J13XRULP@
1336     PODS       CCW    @43210@
1337                CCW    @7@
1338                DC     @6@
1339                       @5@
1340                       @4@
1341                       @2@
1342                       @1@
1343     CTLCOD            @ @
1344     LPRT       DC     @ @
1345     LPINST     DC     @ @
1346     ADDR02     CCW    ERRTAB              ADDR OF ERR TABLE
1347     ERR        CCW    @*ERROR@
1348      ACTION    DC     @REG ERROR ACTION@,G
1349     ERCODE     CCW    @547P@
1350      SAVIND    CCW    @1 2 4 8 A 8@,G
1351      STIND     DC     @1 2 4 8 A 8@,G
1352      ADERSW    DC     @  @
1353
```

```
CT   ADDRS   INSTRUCTION
11   02512   / 02134 00299
 6   02523   . 02681
 1   02529   N
 7   02930   J 02544
 7   02537   J 07869
 6   02544   B 02530
 7   02550   J 01013
12   02557   D 00206 00034 /
11   02569   / 02134 00299
11   02580   / 02185 00299

 8   02598
 4   02602
 1   02603
 1   02604
 1   02605
 1   02606
 1   02607
 1   02608
 1   02609
 1   02610
 1   02611
 5   02616   01858
 6   02622
16   02623
 4   02643
11   02644
11   02656
 2   02668
```

```
PGLIN   LABEL     OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1355                    *** I/O DICOST PROGRAM ***
1356              ***       ERROR CONTROL       ***
1357        THIS ROUTINE DETERMINES IF ANY STATUS ERRORS OR PROGRAM DETECT-
1358        ED ERRORS HAVE TO BE INDICATED,IF THERE ARE THIS ROUTINE BUILDS
1359        THE ERROR MESSAGE AND HAS IF TYPED OUT.THIS ROUTINE ALSO CHECKS
1360        TAC 1 TO SEE IF A REQUEST FOR ERROR ACTION SHOULD BE MADE.
1361
1362              LOCATE FAILING INST
1363
1364   ERRCTL     MLCA   X2,X5               LOAD IND REG 5          12  02670  D 00034 00049 I
1365              S      @1@,X5                                      11  02682  S 08970 00049
1366              SCNLA  0&X5,0&X5           SCAN THE ROUTINE        12  02693  D 00**0 00**0 S B
1367              SAR    X5                  STORE CHAR ADDR          7  02705  G 00049 A
1368              MLCS   1&X5,*&I2           MOVE CHAR TO BE CHKD    12  02712  D 00**1 02735 3
1369              BCE    GOTONE,CODES,       IS OP CODE M            12  02724  B 02768 02598
1370              BCE                        IS OP CODE L             1  02736  B
1371              BCE    SHORT1              IS OP CODE U             6  02737  B 02787
1372              C      X3,X5               HAS ROUTINE BEEN        11  02743  C 00039 00049
1373              BL     LOOPLO               SEARCHED                7  02754  J 02811 T
1374              B      ERRCTL&12           GO CONTINUE THE SRCH     7  02761  J 02682
1375   GOTONE     MLCWA  10&X5,LOOP&9        LOAD THE LOOP INST      12  02768  D 00*/0 01022 X
1376              B      LOOPLO                                       7  02780  J 02811
1377   SHORT1     MLCWA  5&X5,LOOP&9         LOAD THE LOOP INST      12  02787  D 00**5 01022 X
1378              MLCS   @N@,LOOP            SET NO-OP FOR SHORT     12  02799  D 08965 01013 3
1379                                       INSTRUCTION
1380   LOOPLO     MLCA   LOOP&9,234          MOVE FAILING OPER       12  02811  D 01022 00234 T
1381              MLNA   X3,223              MOVE ADDR OF ROUT       12  02823  D 00039 00223 /
1382              ZA     ADDRO2,X1           LOAD NO REG 1           11  02835  DCMOM 02616 00029
1383              ZA     @OO209@,X5          LOAD IND REG 5          11  02846  DCMOM 08975 00049
1384                   SCAN ERROR TABLE & UPDATA ERROR COUNT
1385   ERSCAN     SCNLA  0&X1,0&X1           SCAN THE ERROR TABLE    12  02857  D 000*0 000*0 S B
1386              SAR    X1                  STORE ADDR               7  02869  G 00029 A
1387              BCE    AFTSRH,1&X1,D L     HAS TABLE BEEN COMP.    12  02876  B 02935 000*1 D L
1388              SW     X1-1                DEFINE ERROR             6  02888  , 00028
1389              MLNWA  X1,0&X5             MOVE ERROR CODE NO.     12  02894  D 00029 00**0 W
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1390                A      @33@,X5              UPDATE IND REG 5    11  02906  A 08976 00049
1391                                        NINE TIMES
1392                CW     1@X1,X1-1            CLEAR WM S          11  02917  ¤ 00041 00028
1393                B      ERSCAN                                    7  02928  J 02857
1394                    LOAD PRINT FIELD WITH ERROR MESG
1395      AFTSRH    BCE    WHERE2,1CCC,1        BRCH IF BYPASSING ERRORS  12  02935  B 02185 01000 I
1396      ERRCSW    NOP                                              1  02947  N
1397                BCE    WHERE2,2C9           BRCH IF NO ERRORS   12  02948  B 02185 00209
1398                SW     ERRCSW@1             RESET ERROR SW       6  02960  , 02948
1399                MLCA   ERR,2C6              MOVE ERROR          12  02966  D 02622 002C6 T
1400                MLCA   2@X3,RCUTID          MOVE RCUTINE IDENT  12  02978  D 000C2 03007 T
1401                B      TYP1                 GO TYPE RCUTINE ID   7  02990  J 01593
1402                DCW    @RCUTINE @                                8  03004
1403      RCUTID    CC     @   @,G                                   3  03007
1404                B      TYPES                                     7  03009  J 01517
1405                    TYPE ADDITIONAL  ERROR INFORMATION
1406      EXTRA     NOPWM                                            1  03016  N
1407                WCP    DATA                 PRINT EXTRA DATA    10  03017  M %TO 01710 W
1408                BCB1   *-16                                      7  03027  R 03017 2
1409                BA1    *@1                                       7  03034  R 03041 M G
1410                CW     EXTRA@1                                   6  03041  ¤ 03017
1411                MRCWG  FILE,ADRMES@1C       MOVE FILE ADDRESS USED  12  03047  D 09891 03076 D L
1412                B      TYP1                                      7  03059  J 01593
1413      ADRMES    DCW    @FILE ADDR           @,G                 18  03066
1414      ACT       BCE    *@@,1CC1,1           LOOP ACTION REQUIRED  12  03085  B 03104 01C01 1
1415                B      WHERE2                                    7  03097  J 02185
1416                SW     LUPINT@1             TURN ON SWITCH       6  03104  , 02530
1417                MRCWG  ACTION,2C1           MOVE ACTION MESG    12  03110  D 02623 00201 D L
1418                B      TYPES                                     7  03122  J 01517
1419                B      PROCTL                                    7  03129  J 02273
1420
1421                    *** I/O DIOCST PROGRAM ***
1422                *** DETERMINE WHICH STATUS INDICATORS ARE ON ***
1423          THIS ROUTINE DETERMINES WHICH STATUS INDICATORS ARE ON,ON THE
1424           CHANNEL BEING USED.THE INDICATORS FOUND  ON ARE STORED IN THE
```

```
PGLIN   LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1425          PRINT FIELD AND THE PROGRAM BRANCHES TO ERROR CONTROL.
1426    STACHK    SBR    X5                 STORE ADDR IN IND 5   7  03136  G 00049 B
1427              SBR    X2                                       7  03143  G 00034 B
1428              BN     0&X2,LPRT                                12  03150  V 000.0 02610 1
1429              S      @7@,X5             REDUCE ADDR BY 7      11  03162  S 08977 0C049
1430              MLCS   0&X5,LCOP&10                             12  03173  D 00**0 01023 3
1431              MRCWG  STIND,237          MOVE STATUS CODES     12  03185  D 02656 0C237 L
1432              MLCS   0&X5,NLOPCO        STORE CHNL CODE       12  03197  D 0C**0 03227 3
1433              B      CHALTR                                   7  03209  J 01045
1434              CCW    CNTERR             HIGH LIMIT            5  03220  03382
1435              CC     NCTRDY             LOW LIMIT             5  03225  03240
1436              CCW    @ @                                      1  03226
1437    NLOPCC    CC     @ @                                      1  03227
1438              CC     @ @                                      1  03228
1439              ZA     @CC237@,X5         LOAD IX 5            11  03229  M 08982 0CC49
1440    NCTRDY    NOP                                             1  03240  N
1441              BNR1   CNTERR             CHECK FOR NOT READY   7  03241  R 03382 1
1442              B      UPIX               GO UPDATE IND REG     7  03248  J 03413
1443    BUSY      NOP                                             1  03255  N
1444              BCB1   CNTERR             CHECK FOR BUSY        7  03256  R 03382 2
1445              B      UPIX               GO UPDATE IND REG     7  03263  J 03413
1446    DATACK    NOP                                             1  03270  N
1447              BER1   CNTERR             CHECK DATA CHK        7  03271  R 03382 4
1448              B      UPIX               GO UPDATE IND REG     7  03278  J 03413
1449    EXTCNC    NOP                                             1  03285  N
1450              BEF1   CNTERR             CHECK FOR EXT COND    7  03286  R 03382 8
1451              B      UPIX               GO UPDATE IND REG     7  03293  J 03413
1452    NCTRNS    NOP                                             1  03300  N
1453              BNT1   CNTERR             CHECK FOR NC TRANS    7  03301  R 03382 S
1454              B      UPIX               GO UPDATE IND REG     7  03308  J 03413
1455    WLR       NOP                                             1  03315  N
1456              BWL1   CNTERR             CHECK FOR WLR         7  03316  R 03382 -
1457              B      UPIX               GO UPDATE IND REG     7  03323  J 03413
1458              SW     NCTRDY&1,BUSY&1    RESET INSTRUCTIONS   11  03330  , 03241 03256
1459              SW     DATACK&1,EXTCNC&1                       11  03341  , 03271 03286
```

```
PGLIN    LABEL    OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1460              SW     NOTRNS&1,WLR&1                   11  03352  , 03301 03316
1461              MRCC   237,SAVIND       SAVE IND         12  03363  D 00237 02644 $
1462              B      ERRCTL           RETURN            7  03375  J 02670
1463     CNTERR   SER    X6               STORE RETURN ADDR 7  03382  G 00054 B
1464              A      @7@,X6           UPDATE RETURN ADDR 11 03389  A 08977 00054
1465              CW     ERRDSW&1         TURN OFF ERROR SW  6  03400  ¤ 02948
1466              B      UPIX&1S                            7  03406  J 03432
1467     UPIX     SER    X6               STORE RETURN ADDR 7  03413  G 00054 B
1468              MLCS   @ @,C&X5         REMOVE STATUS CHAR 12 03420  D 08969 CC**C 3
1469              A      @2@,X5           UPDATE IND REG 5   11 03432  A 08983 00049
1470              B      C&X6              RETURN TO PROGRAM  7  03443  J 00*.0
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ACCRS  INSTRUCTION
1472      CTLFLG    ECU    201
1473                PST
```

```
PGLIN   LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1475
1476             DETERMINE WHICH CHANNEL TO USE
1477
1478    START    CW     DEVAC,CUT&1          TURN                11  03450  D 08832 05801
1479             CW     NOGOOD&1,LAST2&1         OFF             11  03461  D 06059 06563
1480             CW     PAS2SW&1,FILE&4              SWITCHES    11  03472  D 07114 09895
1481             CW     SURFSW&1,FLGING&1                        11  03483  D 06588 05210
1482             CW     NOGO&1                                    6  03494  D 07809
1483             MLCA   @OOO,FILE&1          RESET ACCESS & MOD  12  035C0  D 08985 09892 I
1484             SW     FILE&1                                    6  03512  , 09892
1485             S      TRKCNT               RESET TRCK COUNT     6  03518  S 08881
1486             B      TYP1                                      7  03524  J 01593
1487             CCW    @TURN ON MAG & CE-WRT SW@,0              23  03553
1488             H                           WAIT FOR ACTION      1  03555
1489             ZA     @OOOOO@,X15          LOAD IX 15          11  03556  A 08989 00099
1490             ZA     @13322@,X14          LOAD IX 14          11  03567  A 08993 00094
1491    CHE      BCE    *&E,0&X14,F          BRCH IF FILES AVAIL 12  03578  B 03597 00M.0 F
1492             B      UPX15                                     7  03590  J 03719
1493             MLCA   CODE3&X15,TSTCH      MOVE CHANNEL CODES  12  03597  D 081E4 03628 I
1494             B      CHALTR               GO TO CHANNEL ALTER  7  03609  J 01045
1495             CCW    TCP                  TCP LIMIT            5  03620  08825
1496             CC     BCTTCH-1             LCH LIMIT            5  03625  03628
1497             CCW                         CHANNEL              1  03626
1498             CC                                CODES          1  03627
1499    TSTCH    CC     @ @                                       1  03628
1500    BCTTCH   SC     1,FILE               TEST FOR READY FILE 10  03629  M 3F0 09891 R
1501             BAI    *&1                                       7  03639  R 03646 M
1502             BNR1   *&B                  BRCH NOT READY       7  03646  R 03660 1
1503             B      RIGHT1                                    7  03653  J 03760
1504    UP1      A      @1@,FILE             UPDATE ACCESS ADDRESS 11 03660  A 08970 09891
1505             BCE    BCTTCH,FILE,1        BRCH IF NOT ACCESS OVERFLOW 12 03671 B 03629 09891 1
1506             S      @2@,FILE             RESET ACCESS        11  03683  S 08983 09891
1507             A      @1@,FILE&1           UPDATE MODULE ADDRESS 11 03694 A 08970 09892
1508             BZ     *&B                  BRCH IF ALL MOD TRIC  7  03705  J 03719 V
1509             B      BCTTCH                                     7  03712  J 03629
```

```
                    INITIALIZE ROUTINE
PGLIN    LABEL      OPCOD  OPERAND
1510     LPX15      A      @3@,X15          UPDATE IX 1K                  11 03719 A 08976 00099
1511                A      @57@,X14         UPDATE IX 14                  11 03730 A 08995 00094
1512                BCE    ENDTST,X15-1,1   BRCH IF ALL MOD CHKD           12 03741 B 08742 00098 1
1513                B      ONE                                             7 03753 J 03578
1514     RIGHT1     MLNS   FILE&1,RDYMES&16 MOVE MODULE ADDRESS           12 03760 D 09892 03830 1
1515                MLNS   FILE,RDYMES&1C   MOVE ACCESS ADDRESS           12 03772 D 09891 03824 1
1516                MLNS   TSTCH,RDYMES&21  MOVE CHANNEL ADDRESS          12 03784 D 03628 03835 1
1517                CW     OFFON&1,CNOFF&1  CLEAR PATTERN SWITCHES         11 03796 ¤ 05819 06075
1518                B      TYP2             GO TYPE MESSAGE                7 03807 J 01607
1519     RDYMES     DCW    @TSTNG ACC   MOD CH  @,G                      22 03814
1520                DCW    @ @,G            REPLY AREA                     1 03837
1521                BCE    FOUND1,*-13,1    BRCH IF THIS ONE IS           12 03839 B 03858 03837 1
1522                B      UP1                  TO BE TESTED               7 03851 J 03660
1523
1524          PREPARE PROG TO RUN UNDER MODE SELECTED
1525
1526     FOUND1     B      TYP2                                            7 03858 J 01607
1527                DCW    @SEL MODE@,G                                    8 03872
1528     MODE       DCW    @N   @,G                                        5 03874
1529                SW     MODE&1,FILE&2                                  11 03880 , 03875 09893
1530                MLCWA  MODE&4,FILE&5     LOAD ADDRESS                 12 03891 D 03878 09896 X
1531                MLCWA  MODE&4,LOEND      SAVE STARTING ADDRESS        12 03903 D 03878 08885 X
1532                MLCWA  MODE&4,LIMIT      SET FILE ADDRESS LIMIT       12 03915 D 03878 08886 X
1533                BCE    CECYL,MODE&2,#    BRCH IF CE CYL SELECTED      12 03927 B 04458 03876 #
1534                MLCA   LOEND,SAFETY&32   MOVE STARTING ADDR            12 03939 D 08885 04087 T
1535                B      TYP2                                            7 03951 J 01607
1536                DCW    @YOU HAVE SELECTED TO OPERATE ON CUSTOMER TRACKS @ 48 04005
1537                DC     @THIS CAN RESULT IN THE LOSS OF CUSTOMER DATA.THE @ 49 04054
1538     SAFETY     DC     @STARTING ADDRESS SELECTED IS      .ENTER Y OR N @ 47 04055
                                                                  S S
1539                DC     @THIS IS CORRECT@,G                            15 04116
1540                DCW    @   @,G                                         3 04120
1541                C      *-12,INTLOK                                    11 04122 C 04120 08935
1542                BE     SCLND                                           7 04133 J 04202 S
1543     ALARM      B      TYP1                                            7 04140 J 01593
1544                DCW    @SELECTION ERROR,SAFETY INTERLOCK CAUSES RESTART@,G 47 04193
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1545                B      START                                     7  04195  J 0345C
1546      SCUNC     BBE    ALARM,MODE&4,&                           12  04202  W 04140 03878 &
1547                BBE    ALARM,MODE&3,&                           12  04214  W 04140 03877 &
1548                BBE    ALARM,MODE&2,&                           12  04226  W 04140 03876 &
1549                BBE    ALARM,MODE&1,&                           12  04238  W 04140 03875 &
1550                BCE    ALARM,MODE&4,      CHECK FOR MISSED CHARACTERS  12  04250  B 04140 03878
1551                BCE    ALARM,MODE&3,                            12  04262  B 04140 03877
1552                BCE    ALARM,MODE&2,                            12  04274  B 04140 03876
1553                BCE    ALARM,MODE&1,                            12  04286  B 04140 03875
1554                BZN    CHKCYL,MODE,-      BRCH IF USING TRACK      12  04298  V 045C6 03874 K
1555                BZN    CHKTRK,MODE,+      BRCH IF USING SURFACE    12  04310  V 04415 03874 S
1556                BCE    *&&,MODE&4,0       CHECK FOR 0 IN UNITS POSITION  12  04322  B 04341 03878 C
1557                B      ALARM                                     7  04334  J 04140
1558                BBE    ALARM,MODE&3,1     ENTRY ERROR GO TO ALARM   12  04341  W 04140 03877 1
1559                BCE    OCCCHK,MODE&3,2    FURTHER CHECK OF ADDR     12  04353  B 04396 03877 2
1560                BCE    OCCCHK,MODE&3,&                          12  04365  B 04396 03877 &
1561                BBE    ALARM,MODE&2,1     ENTRY ERROR GO TO ALARM   12  04377  W 04140 03876 1
1562                B      CHKCYL                                    7  04389  J 045C6
1563      CCCCHK    BBE    CHKCYL,MODE&2,1                          12  04396  W 045C6 03876 1
1564                B      ALARM                                     7  04408  J 04140
1565      CHKTRK    C      MODE&4,@CC39@                            11  04415  C 03878 08999
1566                BL     ALARM              ENTRY ERROR GO TO ALARM   7  04426  J 04140 T
1567                C      MODE&4,@CCCC@                            11  04433  C 03878 08989
1568                BP     ALARM                                     7  04444  J 04140 U
1569                B      CHKCYL                                    7  04451  J 045C6
1570      CECYL     SW     FILE&4,LCEND-1                           11  04458  , 09895 08884
1571                SW     LIMIT-1                                   6  04469  , 08835
1572                MLCA   @9#6C@,LIMIT       RESET LIMITS             12  04475  D 09003 08836 T
1573                MLCA   @9#2C@,LCEND                             12  04487  D 09007 08885 T
1574                B      CKCPT                                     7  04499  J 046C3
1575      CHKCYL    BZN    CYL,MODE,&                               12  045C6  V 04561 03874 B
1576                BZN    TRCK,MODE,-        BRCH IF USING TRACK      12  04518  V 04592 03874 K
1577                BZN    SURF,MODE,+                              12  04530  V 04579 03874 S
1578                MLNA   @CCCC@,LIMIT       SET FILE ADDR LIMIT      12  04542  D 08989 08836 /
1579                B      CKCPT                                     7  04554  J 046C3
1580      CYL       A      34C@,LIMIT         SET LIMIT                11  04561  A 09009 08836
```

INITIALIZE ROUTINE


```
PGLIN   LABEL   CPCCC  OPERAND                                          CT  ADDRS  INSTRUCTION
1581            B      CKOPT                                             7  04572  J 04603
1582    SURF    SW     SURFSW&1          SET SWITCH TO TEST ONE SWITCH   6  04579  , 06588
1583            B      CKOPT                                             7  04585  J 04603
1584    TRCK    A      @1&,LIMIT         DETERMINE HIGH LIMIT           11  04592  A 08970 08836
1585    CKOPT   PLNS   MODE,OPTNSW       STORE OPTION SELECTD           12  04603  D 03874 08844 1
1586            BCE    CESWCN,OPTNSW,1   WILL HAI BE WRITTEN            12  04615  B 07004 08844 1
1587            B&     INTXIT,CEHAD      BRCH IF CE SWITCH WAS TURNED ON 12  04627  V 04889 08832 1
1588            BCE    CESWCN,OPTNSW,4   WILL HAI BE WRITTEN            12  04639  B 07004 08844 4
1589            BCE    HACFF,OPTNSW,2    BRCH IF VERIFY ADDR ONLY       12  04651  B 04834 08844 2
1590            B      TYP1                                              7  04663  J 01593
1591            DCW    @TURN ON FORMAT SW FOR ACC & HCD BEING TESTED@,G  44  04713
1592            H                                                        1  04715  .
1593            B      TYP2                                              7  04716  J 016C7
1594            DCW    @SELECT PATTERNS ENTER 1 TO USE V & :,2 TO USE V,3 @ 50  04772
1595            DC     @TO USE :@,G                                      8  04780
1596    PS      DCW    @ @,G                                             1  04782
1597            BCE    INTXIT,PS,1       BRCH IF USING BOTH PATTERNS    12  04784  B 04889 04782 1
1598            BCE    *&14,PS,2         BRCH IF USING V PATTERN        12  04796  B 04821 04782 2
1599            SW     OFFON&1           TURN ON BYPASS V SWITCH         6  04808  , 05819
16C0            B      INTXIT                                            7  04814  J 04889
16C1            SW     ONOFF&1           TURN ON BYPASS - SWITCH         6  04821  , 06075
16C2            B      INTXIT                                            7  04827  J 04889
16C3    HACFF   B      TYP1                                              7  04834  J 01593
16C4            DCW    @INSURE CE-HAD SW IS OFF@,G                      23  04863
16C5            H                        WAIT FOR ACTION                 1  04865  .
16C6            ZA     &NC1,X3           LOAD IX 3                      11  04866  M 09014 00039
16C7            BCE    SUPCRE,LCEND-2,6  BRCH IF TESTING CE-CYL         12  04877  B 06759 08883 6
16C8    INTXIT  B      MONITR            GO TO MONITOR                   7  04889  J 02101
16C9
```

```
PGLIN    LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
1611                       *** TEST ROUTINE DESCRIPTION ***
1612                         *** POSITION THE ACCESS ***
1613           THIS ROUTINE SEEKS THE ACCESS TO THE LATEST TRACK AND HEAD ADDR
1614         BEING USED,IT SHOULD BE POINTED OUT THAT THIS ROUTINE IS BYPASSED
1615         WHEN THE ACCRESS CHANGE DOES NOT REQUIRE THE ACCESS TO BE MOVED.
1616         AFTER THE SEEK OPERATION A READ HAC IS ISSUED,THIS READ IS GIVEN
1617         ONLY IF THE CE-HAC SWITCH IS OFF,IF THE READ OP RESULTS IN A
1618         NO RECORD FOUND,ERROR 1 IS INDICATED.ALL STATUS ERRORS ARE ALSO
1619         INDICATED.
1620
1621     NO1        NOP                                             1  04896  N
1622                OC         0012              ROUTINE INDENT     2  04898
1623                SC         1,FILE            POSITION THE ACC   10  04899  M 8F0 09891 R
1624                BOB1       *-16                                 7  04909  R 04899 2 G
1625                B81        STACHK            BRCH ON ANY ERROR  7  04916  R 03136 M
1626                B4         NO1XIT,CEHAO      BRCH IF CE-HAC IS ON 12  04923  V 04979 08832 1
1627                LC         8F5,FILE,R        VERIFY THAT ACC HAS 10  04935  L 8F5 09891 R
1628                BOB1       *-16              ARRIVED AT THE     7  04945  R 04935 2 G
1629                B81        *81               CORRECT ADDR       7  04952  R 04959 M
1630                BEX1       *EE,Y             BRCH EXT COND OR NT  7  04959  R 04973 Y
1631                B          NO1XIT                               7  04966  J 04979
1632                       *** SET ERROR 1 ON ***
1633                S4         E1                SET ERROR 1 ON     6  04973  , 01802
1634           ACCESS POSITIONED INCORRECTLY,READ OP CAUSES NO RECORD FOUND.
1635     NO1XIT     B          MONITR                               7  04979  J 02101
1636
```

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1638                       *** TEST ROUTINE DESCRIPTION ***
1639                    *** WRITE MAXIMUM LENGTH FORMAT IN 8 BIT MODE ***
1640              THIS ROUTINE WRITES A FORMAT IN 8 BIT MODE EACH TIME A NEW
1641            CYLINDER IS BEGUN.IF THE PROGRAM IS BEING RUN IN THE VERIFY ADDR
1642            MODE ONLY THIS ROUTINE IS COMPLETELY BYPASSED.AFTER THE FORMAT IS
1643            WRITTEN IT IS WRITE CHECKED,IF THIS RESULTS IN A DATA CHECK,ERROR
1644            2 IS INDICATED.ALL STATUS ERRORS ARE ALSO INDICATED.
1645
1646            FORMAT WRITTEN IN 8 BIT MODE
1647            44444433333333333333333333333334 HA2 CONSISTS OF 4585 CHARACTERS
1648
1649            FORMAT ORGANIZATION
1650            GAP1--HA1--GAP3--HA2 4585 CHARS--GAP3
1651
1652    NC2       NOP                                              1  04986  N
1653              CC      0026              ROUTINE IDENT          2  04988
1654              BCE     NO2XIT,OPTNSW,2   IS FORMAT BEING WRTN  12  04989  B 05199 08044 2
1655              BCE     NC2XIT,MODE,/     BRCH IF RESTORING A SURFACE  12  05001  B 05199 03874 /
1656              BCE     NC2XIT,MODE,J     BRCH IF RESTORING ONE TRACK  12  05013  B 05199 03874 J
1657              BCE     NO2XIT,MODE,A     BRCH IF RESTORING ONE CYLINDER  12  05025  B 05199 03874 A
1658              SW      DATAFC                                    6  05037  , 09900
1659              ZA      ADDR1,X1C         LOAD IX 1C             11  05043  M 08940 0C074
1660    CLRFLD    CS      06X1C             CLEAR THE DATA FLD      6  05054  / 0C..0
1661              SER     X1C               STORE ADDR REG          7  05060  G 0C074 8
1662              BW      CLRFLD,DATAFC     MORE TO CLEAR          12  05067  V 05054 09900 1
1663              SW      DATAFC&4617       PREPARE TO LOAD         6  05079  , 14517
1664              MLCS    836,DATAFC          DATA FIELD           12  05085  C 08976 09900 3
1665              MRN     DATAFC,DATAFC61   MOVE IN HA1 FORMAT     12  05097  C 09900 09901 9
1666              MLCS    842,DATAFC&4618   SET IN LAST GAP        12  05109  C 09015 14518 3
1667              MLCA    HAAREA,DATAFC&32  MOVE IN HA1 FORMAT     12  05121  C 08877 09932 1
1668              MLCWS   8G6,DATAFC&4615   SET TERMINATING WMGM   12  05133  C 08968 14519 7
1669              MC      *F7,FILE,W        WRITE THE FORMAT       10  05145  M *F7 09891 W
1670              BCBI    *-16                                     7  05155  R 05145 2
1671              BBI     STACHK            BRCH ON ANY ERROR      7  05162  R 03136 M
1672              WCC     1,FILE            WRITE DISK CHECK       10  05169  M *F3 09891 W
```

```
                WRITE FORMAT FOR MAXIMUM LENGTH
PGLIN    LABEL  OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1673            BAL    *68                BRCH ON ANY ERROR     7  05179  R 05193 G
1674            B      NO2XIT                                   7  05186  J 05199 M
1675                 *** SET ERROR 2 ON ***
1676            SW     E2                                       6  05193  . 01803
1677      WRITE CHECK OF FORMAT RESULTS IN DATA CHECK
1678    NO2XIT  B      MONITR                                   7  05199  J 02101
```

```
PGLIN   LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1680                        *** TEST ROUTINE DESCRIPTION ***
1681                      *** WRITE THE HOME ADDRESS 1 AND CHECK IT ***
1682          WHEN THE WRITE ADDRESS MODE IS BEING USED AND THE CE-MAC SWITCH
1683        IS ON THIS ROUTINE WRITES MA1&2.THE ROUTINE ASSUMES THE ACCESS IS
1684        PROPERLY POSITIONED FOR WRITTING THE ADDRESS,AFTER WRITTING MAC
1685        A READ MAC BRINGS THE WRITTEN MA1 BACK INTO MEMORY.THE ADDRESS
1686        READ IS CHECKED IN MEMORY,IF IT DOESN T COMPARE WITH THE ADDRESS
1687        WRITTEN ERROR 3 IS INDICATED.STATUS ERRORS WILL ALSO BE INDICATED
1688
1689        FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE NO2
1690
1691        DATA FIELD USED  WRITE AND READ IN 8 BIT MODE
1692        00CC888   THE FIRST 4 ZEROS ARE MA1,THE FIRST 8 BIT IS THE FLAG
1693
1694    NO3         NOP                                           1  05206  N
1695                CC      @@3@              ROUTINE IDENT       2  05208
1696    FLGING      NOPMM                                         1  05209  N
1697                B       WFCOUN            RETURN TO FLAGGING ROUTINE  7  05210  J 07306
1698                BBE     NO3XIT,OPTNSW,2   IS ROUTINE USED     12  05217  W 05533 08844 2
1699                BCE     NO3XIT,OPTNSW,8   IS ROUTINE USED     12  05229  B 05533 08844 8
1700                BM      *-6,CE-MAC        IS CE-MAC SW ON     12  05241  V 05260 08832 1
1701                B       NO3XIT                                7  05253  J 05533
1702                SM      DATAFD                                6  05260  C 099C0
1703                ZA      ADDR1,X1C         LOAD IX 1C          11  05266  M 08940 00074
1704    CLRSTC      CS      0&X1C             CLEAR STORAGE       6  05277  / 00..0
1705                SBR     X1C                                   7  05283  G 00074 8
1706                BM      CLRSTC,DATAFD                        12  05290  V 05277 099C0 1
1707                MLCWS   &M@,DATAFD&4583   SET TERMONATING WMGM 12  05302  D 08968 14483 7
1708                MLCA    @8E@,FILE&7       RESET MA2           12  05314  D 09017 09898 1
1709                MRCG    FILE&2,DATAFD     MOVE ADDR TO DATAFD 12  05326  D 09893 099C0 8
1710                MLCS    @8@,DATAFD&6      MOVE IN MA2 CHAR    12  05338  D 09018 099C6 3
1711                CM      WLR&1             TURN OFF WLR CHECK   6  05350  @ 03316
1712                LL      8F5,FILE,W        WRITE HOME ADDR     1C  05356  L 8F5 09891 W
1713                BCB1    *-1&              WAIT                7  05366  R 05356 2
1714                BA1     *&1               WAIT                7  05373  R 05380 M
```

```
                WRITE THE HOME ADDR & CHECK IT
PGLIN    LABEL      OPCOD  OPERAND                    BRCH ANY BLT WLR
1715                BEX1   STACHK,S M
1716                SW     DATAFD
1717                ZA     ADDR1,X1C
1718     CLRST1     CS     0&X1C                      CLEAR DATA FIELD
1719                SER    X1C
1720                BW     CLRST1,DATAFD
1721                MLCWS  @G Ma,DATAFD&4583          SET TERMINATING WMGM
1722                LL     %F5,FILE,R                 READ THW HOME ADDR
1723                BAI    *&1
1724                BCE    *&E,CPTNSW,1               BRCH IF WRITTING HAI
1725                B      *&2C
1726                BCE    *&E,MODE,1                 BRCH IF WRITING ENTIRE MODULE
1727                B      *&E
1728                BEX1   STACHK,S M                 BRCH ANY BLT WLR
1729                SW     WLR&1                      TURN CN WLR CHECK
1730                C      DATAFD&5,FILE&7            IS THE ADDR GOOD
1731                BE     *&7                        IF TI S1 BRCH
1732                    *** SET ERROR 3 CN ***
1733                SW     E3                         TURN CN ERROR
1734          ADDRESS READ BACK DOES NOT COMPARE TO ADDRESS WRITTEN
1735     NO3XIT     B      MONITR
1736
```

```
CT  ADDRS  INSTRUCTION
 7  05380  R 03136 S M
 6  05387  , 09900
11  05393  M 08940 00074 G
 6  05404  / 00..0
 7  05410  C 00074 B
12  05417  V 05404 09900 1
12  05429  D 08968 14483 7
10  05441  L %F5 09891 R
 7  05451  R 05458 G M
12  05458  B 05477 08844 1
 7  05470  J 05496
12  05477  B 05496 03874 1
 7  05489  J 05503
 7  05496  R 03136 S M
 6  05503  , 03316
11  05509  C 09905 09898
 7  05520  J 05533 S

 6  05527  , 01804

 7  05533  J 02101
```

ANALYZE DISK SURFACE FOR DEFECTS


```
PGLIN     LABEL     CPCCD  OPERANC                          CT  ADDRS  INSTRUCTION

I738                   *** TEST ROUTINE DESCRIPTION ***
I739                 *** USE BLANKS TO ANALYZE SURFACE ***
I740          THIS ROUTINE WRITES A MAXIMUM RECORD OF BLANKS IN THE 8 BIT
I741        MODE,THE RECORD ACTUALLY BEING THE HA2 AREA,THE RECORD IS READ
I742        BACK AND CHECKED IN MEMORY.IF THE RECORD IS NOT ALL BLANKS THE
I743        PROGRAM BRANCHES TO ROUTINE NO7 WHERE EACH CHARACTER IS CHECKED
I744        UNTIL THE FAILING CHARACTER IS LOCATED.THE PROGRAM RETURNS TO
I745        THIS ROUTINE AND THE RECORD IS WRITTEN AND READ AGAIN.IF THE READ
I746        DATA IS GOOD ON THE 2ND PASS ERROR 5 IS INDICATED,THIS WOULD BE A
I747        SOFT ERROR AND DOES NOT INDICATE A DEFECTIVE SURFACE.IF THE 2ND
I748        PASS READ DATA IS BAD,THE PROGRAM ONCE MORE BRANCHES TO ROUTINE
I749        NO7 FOR A CHARACTER BY CHARACTER CHECK.IF THE FAILING CHARACTER
I750         LOCATION IN RECORD  IS THE SAME AS THE FIRST PASS,ERROR 4 IS
I751        INDICATED.THIS WOULD BE A SOLID ERROR AND A STRONG INDICATION OF
I752        A DEFECTIVE TRACK.IF THE FAILING CHARACTER IS NOT THE SAME AS THE
I753        FIRST PASS ERROR 5 WOULD BE INDICATED.ALL STATUS ERRORS BUT WRONG
I754        LENGTH RECORD WILL ALSO BE INDICATED.
I755        FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE NO2
I756
I757        DATA FIELD USED IN 8 BIT MODE
I758        4585 BLANKS,THE ENTIRE FIELD IS HA2
I759
I760
I761                   PART I USE BLANKS TO ANALYZE SURFACE
I762
I763      N04         NOP
I764                  DC      @04@                ROUTINE IDENT          1  05540  N
I765                  BCE     NO&XIT,OPTNSW,1     IS THIS ROUTINE USED   2  05542
I766                  BCE     NO&XIT,OPTNSW,2     IS THIS ROUTINE USED  12  05543  B 06320 08844 1
I767                  BB      NO&XIT,CEMAC        IS THE CE-MAC SW ON   12  05555  B 06320 08844 2
I768                  B       NO4XIT              BYPASS THIS ROUTINE   12  05567  V 06320 08832 1
I769                  CW      WLR61               TURN OFF WLR CHECK     7  05579  J 05808
I770      IN          SW      DATAFD                                     6  05586  ¤ 03316
I771                  ZA      ADDR2,X1C           LOAD IX 1C             6  05592  & 099C0
I772      CLEAR       CS      O&XIC               CLEAR                 11  05598  # 08945 00074
                                                                         6  05609  / 0C!!0
```

```
PGLIN   LABEL   OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1773            SBR    X1C                  CLT                 7  05615  G 00074 B
1774            BN     CLEAN,DATAFD         THE DATA FLD       12  05622  V 05609 09900 1
1775            MLCWS  BMG,DATAFD&4576     SET TERMINATING WMGP 12  05634  D 08968 14478 7
1776            MLCS   B B,TSTBIT          SAVE THE TST BIT    12  05646  D 08969 08879 3
1777            LU     %F5,FILE,W           WRITE HA2 FULL TRACK 10  05658  L %F5 09891 W
1778            BCBI   *-16                                      7  05668  R 05658 2
1779            BAI    *&1                                       7  05675  R 05682 GM
1780            BEXI   STACHK,SM            BRCH ANY BLT WLR    7  05682  R 03136 SM
1781    MARK3   LU     %F5,FILE,R           READ HA2 & FULL TRACK 10 05689  L %F5 09891 R
1782            BAI    *&1                                       7  05699  R 05706 GM
1783            BEXI   STACHK,SM            BRCH ANY BLT WLR    7  05706  R 03136 SM
1784            SN     DATAFD,WLR&1                             11  05713  . 09900 03316
1785            C      DATAFD&4577,DATAFD&4576                  11  05724  C 14477 14476
1786                CHECK THE DATA FLD IN MEMORY
1787            BE     FIRST                IF FLD IS OK BRCH   7  05735  J 05769 S
1788            B      CHARCK               GO TO CHAR CHECK    7  05742  J 07045
1789            B      MARK3                                    7  05749  J 05689
1790                *** SET ERROR 4 ON ***
1791            SN     E4                   TURN ON ERROR IND   6  05756  . 01805
1792      ON 2 PASSES THE SAME CHARACTER LOCATION FAILED,PROBABLY DEFECTIVE
1793      SURFACE
1794            B      OUT                                      7  05762  J 05800
1795    FIRST   BN     *&8,PAS2SW&1         BRCH IF SECOND PASS 12  05769  V 05788 07114 1
1796            B      OUT                                      7  05781  J 05800
1797            CN     PAS2SW&1             TURN OFF PASS SW    6  05788  N 07114
1798                *** SET ERROR 5 ON ***
1799            SN     E5                   TURN ON ERROR IND   6  05794  . 01806
1800      CHARACTER LOCATION FAILED ONCE ON TWO PASSES
1801    CLT     NOPWM                                            1  05800  N
1802            B      BACKON                                   7  05801  J 07771
1803    NO4XIT  B      MONITR                                   7  05808  J 02101
1804
1805                PART II USE V TO ANALYZE SURFACE
1806
1807              *** TEST ROUTINE DESCRIPTION ***
```

```
                ANALYZE DISK SURFACE FOR DEFECTS
PGLIN    LABEL  OPCOD  OPERAND                                  DC01        PAGE  52
                                                             CT  ADDRS  INSTRUCTION
1808
1809          *** USE WORD MARK V TO ANALYZE SURFACE ***
1810        THIS ROUTINE FUNCTIONS IN THE SAME WAY AS ROUTINE NO4 EXCEPT
1811        WORD MARK V IS USED. SINCE WORD MARKS ARE USED IT IS
1812        VERY DIFFICULT TO CHECK THE DATA IN MEMORY SO A WRITE DISK CHECK
1813        IS USED TO CHECK THE DATA WRITTEN.IF A DATA CHECK RESULTS THEN
1814        THE RECORD IS READ BACK INTO MEMORY AND A CHARACTER BY CHARACTER
1815        CHECK IS MADE.THE LOCATION OF THE FAILING CHARACTER IS SAVED AND
1816        THE ROUTINE IS REPEATED.ON THE 2ND PASS IF THE WRITE CHECK DOES
1817        NOT FAIL,OR IF IT DOES BUT THE FAILING CHARACTER LOCATION IS NOT
1818        THE SAME AS THE FIRST PASS,ERROR 7 IS INDICATED.IF ON THE 2ND
1819        PASS A FAILURE OF SAME CHARACTER LOCATION OCCURES,ERROR 6 IS
1820        INDICATED,THIS BEING THE SOLID ERROR.ALL STATUS ERRORS WILL ALSO
1821        BE INDICATED.
1822
1823        FORMAT REQUIRED IS THE SAME AS DESCR2BED TO ROUTINE NO2
1824
1825        DATA FIELD USED 8 BIT MODE
1826        4585 WORD MARK V,WRITTEN AS HA2
1827
1828  NO5   NOP
1829              CC     @C5@                ROUTINE IDENT                    1  05815  N
1830  OFFON       NOPWM                                                       2  05817
1831              B      NO5XIT              BYPASS                           1  05818  N
1832              CW     WLRG1               TURN OFF WLR CHECK               7  05819  J 06064
1833  GETRCY      ZA     ACCR2,X1C           LOAD 1X 1C                       6  05826  ¤ 03316
1834              SW     DATAFD              CLEAR                           11  05832  M 08945 00074
1835  CLEAN3      CS     0&X1C                   THE                          6  05843  , 09900
1836              SBR    X1C                      DATA                        6  05849  / CC.:.0
1837              BW     CLEAN3,DATAFD             FIELD                      7  05855  G 00074 B
1838              SW     DATAFD                                              12  05862  V 05849 09900 1
1839              MLCWS  @V@,DATAFD&4577     LOAD THE                         6  05874  , 09900
1840              MLCWB  DATAFD&4577,DATAFD&4576      DATA FIELD             12  05880  D 09019 14477 7
1841              MLCWS  @V@,TST8IT          SAVE THE TEST BIT               12  05892  D 14477 14476 P
1842              MLCWS  @M@,DATAFD&4576     SET TERMINATING WMGM            12  05904  D 09019 08879 7
                  LL     %F5,FILE,W          WRITE HA2 FULL TRCK             12  05916  D 08968 14478 7
                                                                             10  05928  L %F5 09891 W
```

```
                ANALYZE DISK SURFACE FOR DEFECTS
PGLIN   LABEL   CPCCD  OPERAND
1843            BAI    *&1
1844            BEXI   STACHK,S,M
1845    WRTCHK  LL     %F3,FILE,W          BRCH ANY BUT WLR
1846                                       WRITE DISK CHECK
1847            BAI    *&1
1848            BEXI   STACHK,,            BRCH ON ANY BUT DC
1849            BERI   *&&                 BRCH ON DATA CHECK
1850            B      NOSXIT
1851    MARK2   S      TENCNT
1852            LL     %F3,FILE,W          WRITE CHECK FOR 2ND ERROR
1853            BAI    *&1
1854            BERI   NCGCCC              BRCH ON DATA CHECK
1855            A      &1&,TENCNT          COUNT TEN PASSES
1856            BZ     SOFT                BRCH AFTER TEN PASSES
1857            B      MARK2&&             GO TRY AGAIN
1858          *** ERROR 7 ***
1859    SOFT    SW     E7                  TURN ON ERROR INDICATE
1860      WDC FAILED ONE TIME ON FIRST TRY,THIS IS CONSIDERED A SOFT ERROR
1861            B      NOSXIT
1862          *** ERROR 6 ***
1863    NCGCCC  SW     E6                  TURN ON ERROR INDICATE
1864      WDC FAILED TWICE,THIS IS CONSIDERED A HARD ERROR AND THE TRACK
1865      SHOULD BE FLAGGED
1866    NOSXIT  B      MONITR
1867
1868                PART III USE - TO ANALYZE SURFACE
1869
1870              *** TEST ROUTINE DESCRIPTION ***
1871          *** USE - TO ANALYZE SURFACE ***
1872      THIS ROUTINE IS THE SAME AS ROUTINE NC4 EXCEPT THAT   IS USED
1873    INSTEAD OF BLANK.SOFT ERRORS ARE INDICATED BY ERROR 9,AND TWO
1874    SUCCESSIVE CHARACTER LOCATION FAILURES ARE INDICATED BY ERROR 8.
1875    FOR GREATER DETAIL CHECK ROUTINE NC4 DESCRIPTION.
1876
1877    FORMAT RECLIREC IS THE SAME AS DESCRIBED IN ROUTINE NC2
1878
        DATA FIELD USED
```

```
CT  ADDRS  INSTRUCTION
 7  05938  R 05945 G,M
 7  05945  R 03136 S,M
10  05952  L %F3 09891 W
 7  05962  R 05969 G,M
 7  05969  R 03136 &
 7  05976  R 05990 4
 7  05983  J 06064
 6  05990  S 08951
10  05996  L %F3 09891 W
 7  06006  R 06013 G,M
 7  06013  R 06058 4
11  06020  A 08970 08951
 7  06031  J 06045 V
 7  06038  J 05996

 6  06045  & 01808

 7  06051  J 06064

 6  06058  & 01807


 7  06064  J 02101
```

```
PGLIN   LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1879        4578 -,WRITTEN AS WA2
1880
1881    WC6      WCP                                               1  06071  N
1882             DC     @C6@              ROUTINE IDENT           2  06073
1883    CWOFF    WCPWW                                             1  06074  N
1884             B      WC6XIT            BY-PASS THIS ROUTINE    7  06075  J 06320
1885             CW     WLR61             TURN OFF WLR CHECK      6  06082  Q 03316
1886    GETSET   ZA     ADDR2,X1C         LOAD IX 1C             11  06088  M 08945 00074
1887             SW     DATAFD            CLEAR                   6  06099  , 09900
1888    CLEAN5   CS     0&X1C                 THE                 6  06105  / 00..0
1889             SBR    X1C                     DATA              7  06111  G 00074 B
1890             BW     CLEAN5,DATAFD             FIELD           12  06118  V 06105 09900 1
1891             SW     DATAFD                                    6  06130  , 09900
1892             MLCS   @,@,DATAFD64577   LOAD                   12  06136  D 09020 14477 3
1893             MLCB   DATAFD64577,DATAFD64576                   12  06148  D 14477 14476 L
1894             MLCS   @,@,TSTBIT        SAVE                   12  06160  D 09020 08879 3
1895             MLCWS  @M@,DATAFD64578   SET TERMINATING WAGM    12  06172  D 08968 14478 7
1896             LU     %F5,FILE,W        WRITE WA2 FULL TRK     10  06184  L %F5 09891 W
1897             BAI    *61                                       7  06194  R 06201 M
1898             BEX1   STACHK,M          BRCH ANY BLT WLR        7  06201  R 03136 M
1899             LU     %F3,FILE,W        WCC THE DATA PATTERN   10  06208  L %F3 09891 W
1900             BAI    *61                                       7  06218  R 06225 M
1901             BEX1   STACHK,,          BRCH ON ANY BLT DATA CHECK  7  06225  R 03136 ,
1902             BER1   *6E               BRCH ON DATA CHECK      7  06232  R 06246 4
1903             B      WC6XIT                                    7  06239  J 06320
1904    MARK     S      TENCNT            RESET COUNTER           6  06246  S 08951
1905             LU     %F3,FILE,W        WRITE CHECK FOR 2ND ERROR  10  06252  L %F3 09891 W
1906             BAI    *61                                       7  06262  R 06269 M
1907             BER1   NUCNIC           BRCH ON DATA CHECK      7  06269  R 06314 4
1908             A      @1@,TENCNT        COUNT TEN PASSES       11  06276  A 0897C C8951
1909             BZ     SOFTIE            BRCH AFTER 10           7  06287  J 063C1 V
1910             B      MARK66            TRY AGAIN               7  06294  J 06252
1911            *** ERROR 9 ***
1912    SOFTIE   SW     E9                TURN ON ERROR IND       6  063C1  , 01810
1913      WCC FAILED ONE TIME ON FIRST TRY,THIS IS CONSIDERED A SOFT ERROR
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
1914                B      NO6XIT                                      7  06307  J 06320
1915              *** ERROR 8 ***
1916      NLCNIC    SW     E8                  TURN ON ERROR IND       6  06314  , 01809
1917        NEC FAILED TWICE,THIS IS CONSIDERED A HARD ERROR AND THE TRACK
1918        SHOULD BE FLAGGED
1919      NO6XIT    B      MCNITR                                      7  06320  J 02101
```

VERIFY HA1 ADDRESSES

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1921			*** TEST ROUTINE DESCRIPTION ***				
1922			*** VERIFY THAT HA1 ADDRESSES ARE CORRECT ***				
1923			WHEN RUNNING IN A MODE THAT USES THIS ROUTINE AND THE CE-HAD				
1924			SWITCH IS OFF A READ HAD CP IS ISSUED.IF THE READ HAD CP RESULTS				
1925			IN A NO RECORD FOUND,ERROR 10 IS INDICATED.IF THE ERROR OCCURS				
1926			THE PROGRAM WILL REQUEST THE CE-HAD SWITCH BE TURNED ON,THE FAIL-				
1927			ING ADDRESS IS THEN READ BACK INTO MEMORY AND DISPLAYED FOR				
1928			ANALYSIS.ALL STATUS ERRORS ARE ALSO INDICATED.				
1929							
1930	NC9	NOP			1	06327	N
1931		DC	@C8@	ROUTINE IDENT	2	06329	
1932		BCE	NC8XIT,OPTNSW,2	BRCH IF NOT USED	12	06330	B 06552 08844 3
1933		BN	NC8XIT,CEHAD	IS CE-HAD SW ON	12	06342	V 06552 08832 1
1934		ZA	ADDR2,X1C		11	06354	M 08945 00074
1935		SW	DATAFD		6	06365	, 09900
1936	CLRST2	CS	08X1C	CLER DATA FLD	6	06371	/ 00..0
1937		SER	X1C		7	06377	G 00074 B
1938		BN	CLRST2,DATAFD		12	06384	V 06371 09900 1
1939		MLCWS	2@8,DATAFD&4578	SET TERMINATING WMGP	12	06396	C 08968 14478 7
1940		LL	%F5,FILE,R	READ HA2 FULL TRK	10	06408	L %F5 09891 R
1941		BCB1	*-16		7	06418	R 06408 2
1942		BA1	*&I		7	06425	R 06432 M
1943		BEX1	*&&,Y	BRCH ON NO-IR CR.EC	7	06432	R 06446 Y
1944		B	NC8XIT		7	06439	J 06552
1945			*** SET ERROR 1C ON ***				
1946		SW	E1C	TURN ON ERROR IND	6	06446	, 01811
1947			READ HAD RESULTS IN A NO RECORD FOUND				
1948		BCE	*&&,SPTADD,1	BRCH IF IN MANUAL MD	12	06452	B 06471 01004 1
1949		B	NC8XIT		7	06464	J 06552
1950		B	MCNITR	GO INDICATE ADDR ERR	7	06471	J 02101
1951		B	CESWON		7	06478	J 07004
1952		ML	%F5,FILE,R	READ BACK ADDR	10	06485	M %F5 09891 R
1953		BA1	*&I		7	06495	R 065C2 M
1954		SW	DATAFD		6	065C2	, 09900
1955		MLCA	DATAFD&4,ADRMSG&16	MOVE FAILING ADDR	12	065C8	D 09904 06543 T

PGLIN	LABEL	OPCCD	OPERAND	CT	ADDRS	INSTRUCTION
1956		B	TYP1 GO TYPE MESSAGE	7	06520	J 01593
1957	ADRMSG	CCW	3HA1 READ IS @,G	17	06527	
1958		B	SWCFF GO TURN OFF CE-HAC	7	06545	J 06965
1959	HC8XIT	B	MONITR	7	06552	J 02101
1960						

```
PGLIN   LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1962                       *** TEST ROUTINE DESCRIPTION ***
1963                    *** FILE ACCRESS UPDATE ROLTINE ***
1964              THIS ROUTINE UPDATES THE HA1 ADDRESS IN THE FILE ADDRESS,IT
1965             DETERMINES WHEN A CYLINDER HAS BEEN COMPLETED AND WHEN ALL OF THE
1966             CUSTOMER CYLINDERS HAVE BEEN COMPLETED.WHEN A CYLINDER IS
1967             COMPLETED AND THE NEXT CYLINDER MUST BE STARTED IT INSURES THAT
1968             THE POSITION ACCESS ROUTINE IS RUN.WHEN ALL CUSTOMER CYLINDERS
1969             HAVE BEEN COMPLETED IT SETS THE FILE ADDRESS FOR THE DIAGNOSTIC
1970             CYL.IN ADDITION THIS ROUTINE CHECKS WHEN THE PROGRAM IS COMPLETED
1971             ACCORDING TO THE MODE BEING RUN,1 TRACK,1 CYLINDER,THE ENTIRE MOD
1972             CR 1 SURFACE
1973   NO9       NOP
1974              CC      @C9@              ROUTINE IDENT                1  06559  N
1975   LAST2     NOPWM                                                    2  06561
1976              B       TWO53             BRCH WHEN SW IS ON           1  06562  N
1977              SW      FILE@2                                         7  06563  J 06784
1978              ZA      ONE1,X3           LOAD IX 3                    6  06570  Q , 09893
1979   SURFSW    NOPWM                                                   11  06576  M 09014 00039
1980              B       UPSURF                                         1  06587  N
1981              A       A1@,FILE@5        UPDATE ADDR                  7  06588  J 06843
1982              C       FILE@5,LIMIT      LIMIT REACHED               11  06595  A 08970 09896
1983              BE      ANYMCR            IF SO BRCH                  11  06606  C 09896 08836
1984              A       A1@,TRKCNT        UPDATE TRCK CNT              7  06617  J 0669( S
1985              MRCWG   FILE,DATA         MOVE NEW ADDR               11  06624  A 08970 08881
1986              SW      EXTRA@1           TURN ON EXT DATA SW          12  06635  D 09891 01710 DL
1987              BCE     CYLCMP,TRKCNT-1,4 BRCH IF CYL COMPLETE          6  06647  , 03017
1988              ZA      ONE3,X3           LOAD IND REG 3               12  06653  B 06683 08880 4
1989              B       NO3               GO TO ROUTINE 3              11  06665  M 09025 00039 CC
1990   CYLCMP     S       TRKCNT            RESET TRK COUNT              7  06676  J 052C6
1991              B       NO1               GO TO ROUTINE 1              6  06683  S 08881
1992   ANYMCR     S       TRKCNT            RESET TRCK COUNTER           7  06689  J 04896
1993              BZN     SUMCRE,MODE,2     RUNNING ENTIRE MOD           6  06696  S 08881
1994              BW      AGAIN,CE-MAC      IS CE-MAC SW ON             12  067C2  V 06759 03874 2
1995              B       ALLDUN                                        12  06714  V 06733 08832 1
1996   AGAIN      B       SWOFF                                          7  06726  J 06891
                                                                        7  06733  J 06965
```

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PGLIN     LABEL     OPCOD  OPERAND                          COMMENTS                              CT  ADDRS  INSTRUCTION
1997                MLCA   LCEND,FILE&5                     RESET ADDR                            12  06740  D 08885 09896 T
1998                B      NO1                              GO TO ROUTINE 1                        7  06752  J 04896
1999      SUMORE    SW     LAST2&1                                                                 6  06759  , 06563
2000                MLCA   @9#2@,FILE&5                     RESET FILE ADDR                       12  06765  D 09007 09896 T
2001                B      NO1                              GO TO ROUTINE 1                        7  06777  J 04896
2002      TWO53     SW     FILE&4                                                                  6  06784  , 09895
2003                A      @1@,FILE&5                       UPDATE ADDR                           11  06790  A 08970 09896
2004                MRCWG  FILE,DATA                        SET ADDR IN DATA FLD                  12  06801  C 09891 01710 D L
2005                BCE    ALLDUN,FILE&4,6                  ARE CE TRCKS COMPLET                  12  06813  B 06891 09895 6
2006                ZA     &NC3,X3                          LOAD INO REG 3                        11  06825  M 09025 00039 Q
2007                B      NO3                              GO TO ROUTINE 3                        7  06836  J 05206
2008      UPSURF    A      @4C@,FILE&5                      UPDATE BY 40 TO ADDRESS NEXT TRCK     11  06843  A 09009 09896
2009                C      FILE&5,LIMIT                     HAS SURFACE BEEN COMPLETED            11  06854  C 09896 08836
2010                BE     *&E                              IF SO BRCH                             7  06865  J 06879 S
2011                B      NO1                              GO TEST NEXT TRACK                     7  06872  J 04896
2012                BW     AGAIN,CEHAC                      BRCH IF WRITTING ADDRESSES            12  06879  V 06733 08832 1
2013      ALLDUN    CW     LAST2&1,FILE&4                   TURN OFF PASS SW                      11  06891  D 06563 09895
2014                CW     SURFSW&1                         TURN OFF SURFACE TEST SWITCH           6  06902  D 06588
2015                MLCA   LCEND,FILE&5                                                           12  06908  D 08885 09896 T
2016                BW     *&E,CEHAC                        IS CE-HAC SW ON                       12  06920  V 06939 08832 1
2017                B      UP1                              GO FIND ANOTHER MOD                    7  06932  J 03660
2018                B      SWOFF                                                                   7  06939  J 06965
2019                BCE    SUMORE,LCEND-2,#                 BRCH IF TESTING CE-CYL                12  06946  B 06759 08883 #
2020                B      NO1                                                                     7  06958  J 04896
2021      SWOFF     SBR    OFFXIT&5                         STORE RETURN ADDR                      7  06965  G 07002 8
2022                B      TYP1                             GO TO TYPE ROUTINE                     7  06972  J 01593
2023                DCW    @CE-HAC OFF@,G                                                         10  06988
2024                H                                                                             1  06990  .
2025                CW     CEHAC                            TURN OFF CE-HAC SW                     6  06991  D 08832
2026      OFFXIT    B      0                                                                       7  06997  J 00000
2027      CESWON    SBR    ONXIT&5                          STORE RETURN ADDR                      7  07004  G 07040 8
2028                B      TYP1                                                                    7  07011  J 01593
2029                DCW    @CE-HAC ON@,G                                                          9  07026
2030                H                                                                             1  07028  .
2031                SW     CEHAC                                                                  6  07029  , 08832
```

PGLIN	LABEL	OPCCD	OPERAND	CT	ADDRS	INSTRUCTION
2032	CNXIT	B	0	7	07035	J 00000

```
PGLIN  LABEL    OPCOD  OPERAND                  COMMENTS                    CT  ADDRS  INSTRUCTION
2034                     OF THE DATA FIELD
2035                  *** TEST ROUTINE DESCRIPTION ***
2036               *** CHARACTER BY CHARACTER CHECK ROUTINE ***
2037          THIS ROUTINE IS USED BY ROUTINE NO4 & NO6,THO FO THE SURFACE
2038        ANALYSIS ROUTINES.THE ROUTINE CHECKS EVERY CHARACTER IN THE REC.
2039        READ BACK FROM THE FILE,WHEN A CHARACTER IS LOCATED WHICH WAS NOT
2040        RECORDED ITS LOCATION IN THE RECORD IS STORED IN INDEX REG. 7,AND
2041        THE ROUTINE RETURNS TO THE ROUTINE THAT DISCOVERED THE FAILURE.
2042        IF THE SAME TRACK FAILS AGAIN THIS ROUTINE CHECKS EVERY CHARACTER
2043        AND WHEN IT LOCATES A FAILURE THE LOCATION IN THE RECORD IS CHECK
2044        ED AGAINST THE FIRST FAILING LOCATION.IF THE LOCATIONS ARE THE
2045        SAME A SOLID ERROR WILL BE INDICATED,IF NOT A SOFT ERROR IS IND.
2046
2047    NO7       NOP                                                    1  07042  N
2048              DC      @07@                                           2  07044
2049    CHARCK    SER     X8               STORE RETURN ADDR             7  07045  G 00064 8
2050              ZA      @45848@,X6       LOAD IX 6                    11  07052  M 09029 00054
2051              MVCS    TSTBIT,*&12      MOVE THE TEST BIT            12  07063  D 08879 07086 3
2052    CHKCNE    BCE     *&&,DATAFD&X6    CHECK EACH CHAR              12  07075  B 07094 09Z.0
2053              B       PAS2SW                                         7  07087  J 07113
2054              BW      PAS2SW,DATAFD&X6 CHEK FOR WM                  12  07094  W 07113 09Z.0 1
2055              B       MATCH                                          7  07106  J 07145
2056    PAS2SW    NOPWM                                                  1  07113  N
2057              B       PASS2                                          7  07114  J 07170
2058              ZA      X6,X9            SAVE ADDR OF BAD CHAR        11  07121  M 00054 00069
2059              SW      PAS2SW&1         TURN ON PASS SW               6  07132  , 07114
2060              B       0&X8                                           7  07138  J 00.00
2061    MATCH     S       @1@,X6           REDUCE IND REG 6 BY1         11  07145  S 08970 00054
2062              BZ      20&X8            BRCH ON ZERO RESULTS          7  07156  J 00.20 V
2063              B       CHKCNE           GO CHECK ANOTHER CHR          7  07163  J 07075
2064    PASS2     CW      PAS2SW&1         TURN OFF SWITCH               6  07170  D 07114
2065              C       X6,X9            SAME CHAR BAD ON 2           11  07176  C 00054 00069
2066              BE      7&X8               PASSES,IF SO BRCH           7  07187  J 00.07 S
2067              B       39&X8            DIFFERENT CHAR BAD            7  07194  J 00.39
2068
```

```
                    CHARACTER BY CHARACTER CHECK
FGLIN     LABEL     CPCCD  OPERAND                                  CT  ADDRS  INSTRUCTION
```

```
PGLIN    LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2070                     *** TEST RCUTINE DESCRIPTION ***
2071                   *** FLAG A DEFECTIVE TRACK ***
2072            THIS RCUTINE IS ENTERED ONLY AT THE DIRECTION OF CE,ITS PURPOSE
2073           IS TO ALLOW THE CE TO FLAG DEFECTIVE TRACKS AND TO INSURE THAT
2074           THE SELECTED ALTERNATE TRACK IS FREE OF DEFECTS.THE CE SELECTS
2075           THE RCUTINE AS A PROGRAM OPTION AND AT THE SAME TIME ENTERS THE
2076           HAI ADDRESS AND FLAG CHARACTER.THE RCUTINE POSITIONS THE ACCESS,
2077           WRITES THE HOME ADDRESS ON THE ALTERNATE TRACK PLUS A CODE CHAR-
2078           ACTER,AND WRITES THE FLAG BIT ON THE DEFECTIVE TRACK.THE CE-MAC
2079           SWITCH IS TURNED OFF AND A READ HAD IS ISSUED,IF A NO RECORD
2080           FOUND RESULTS ERROR 11 IS INDICATED.IF THE TRACK READ DOESN T
2081           CONTAIN THE CODE CHARACTER RECORDED ON THE ALTERNATE TRACK ERROR
2082           12 IS INDICATED,THE ALTERNATE TRACK DID NOT GET SELECTED.IF
2083           EITHER ERROR 11 OR 12 OCCUR THE CE SHOULD RE-SELECT THE FLAG
2084           ROUTINE USING A DIFFERENT FLAG CHAR.IF THERE HAVE BEEN NO ERROR
2085           INDICATIONS A MSG,TRCK FLGD OK,IS TYPED OUT THE CE NOW SELECTS
2086           ANY PROGRAM OPTION AVAILABLE,NORMALLY THE CONTINUE OPTION WOULD
2087           BE TAKEN.ALL STATUS ERRORS WILL BE INDICATED.
2088
2089
2090           NOTE EXTREME CAUTION SHOULD BE USED WHEN SELECTING A FLAG CHAR-
2091           ACTER,SO THAT AN ALTERNATE TRACK THAT IS ALL READY IN USE IS NOT
2092           SELECTED AGAIN.
2093
2094
2095           FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE NO2
2096
2097           DATA FIELD USED ON ALTERNATE TRACK AND DEFECTIVE TRACK
2098           HA1-FLAG CHAR-HA2-CODE CHARACTER  CODE CHAR IS A IN POSITION 8
2099            EXAMPLE  CCC0888A   ALTERNATE TRACK
2100           EXAMPLE  CCCC288N   DEFECTIVE TRACK
2101
2102     N10         NOP                                                   1  07201  N
2103                 DC     @1C@              ROUTINE IDENT               2  07203
2104                 MLOB   FILE65,SAVADD     SAVE FILE ADDR             12  07204  D 09896 08894 L
```

FLAGGING ROUTINE

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2105		ZA	&N1C,X3	LOAD IND REG 3	11	07216	GM 09034 CCC39
2106		MLCS	206,FLGCHR	SAVE SELECTED FLAG CHARACTER	12	07227	D 00206 08964 3
2107		MLCA	206,FILE&6	MOVE FLAG ADDR	12	07239	D 00206 09897 1
2108		CS	295	CLEAR CONTROL FLD	6	07251	/ 00299
2109		SD	1,FILE	POSITION ACCESS	10	07257	M %F0 09891 R
2110		BCB1	*-16		7	07267	R 07257 2
2111		BA1	*&1		7	07274	R 07281 GM
2112		BW	WFCOUN,CEHAO	BRCH IF SW IS ON	12	07281	V 07306 08832 1
2113		CW	BACKON&1		6	07293	B 07772
2114		B	CESWCN		7	07299	J 07004
2115	WFCOUN	MRCWG	FILE&2,DATAFD	LOAD ADDR IN DATA FLD	12	07306	D 09893 09900 DL
2116		MLCA	@888A@,DATAFD&7	SET HA 2	12	07318	D 09038 09907 1
2117		MLCWS	@M@,DATAFD&23	SET TERMONATING WMGM	12	07330	D 08968 09923 7
2118		LL	%F5,FILE,W	WRITE HA1 ON ALTER	10	07342	L %F5 09891 W
2119		BCB1	*-16		7	07352	R 07342 2
2120		BA1	*&1		7	07359	R 07366 GM
2121		LL	%F5,FILE,R	CHECK FOR PROPER MODE	10	07366	L %F5 09891 R
2122		BA1	*&1		7	07376	R 07383 GM
2123		BEX1	*&8,S M	BRCH ON 8 BIT ERROR	7	07383	R 07397 SM
2124		B	OTHER		7	07390	J 07462
2125		MRCWG	FILE&2,DATAFD	LOAD ADDR IN DATA FLD	12	07397	D 09893 09900 DL
2126		MLCA	@888A@,DATAFD&7	SET HA2	12	07409	D 09038 09907 1
2127		ML	%F5,FILE,W	WRITE HA1 IN SIX BIT MODE	10	07421	M %F5 09891 W
2128		BA1	*&1		7	07431	R 07438 GM
2129		ML	%F5,FILE,R	CHECK FOR PROPER MODE	10	07438	M %F5 09891 R
2130		BA1	*&1		7	07448	R 07455 GM
2131		BEX1	STACHK,S M	GO REPORT ERRORS	7	07455	R 03136 SM
2132	OTHER	MRCWG	FILE&2,DATAFD	MOVE FILE ADDR	12	07462	D 09893 09900 DL
2133		MLCS	@8@,FILE&6	RESTORE HA2	12	07474	D 09018 09897 3
2134		MLCA	@888N@,DATAFD&7	LOAD HA2 & CODE CHARACTER	12	07486	D 09042 09907 1
2135		MLCS	FLGCHR,DATAFD&4	LOAD FLAG CHARACTER	12	07498	D 08964 09904 3
2136		LL	%F5,FILE,W	WRITE FLAG BIT	10	07510	L %F5 09891 W
2137		BA1	*&1		7	07520	R 07527 GM
2138		LL	%F5,FILE,R	CHECK FOR PROPER MODE	10	07527	L %F5 09891 R
2139		BA1	*&1		7	07537	R 07544 GM
2140		BEX1	*&8,S M	BRCH ON 8 BIT ERROR	7	07544	R 07558 SM

```
PGLIN   LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2141             B      OTHER1                                    7  07551  J 07647
2142             MRCHG  FILE&2,DATAFD                  LOAD ADDR IN DATA FLD  12  07558  D 09893 09900 C L
2143             MLCA   @888N&,DATAFD&7                LOAD HA2 & CODE CHARACTER  12  07570  D 09042 09907 T
2144             MLCS   FLGCHR,DATAFD&4                LOAD FLAG CHARACTER  12  07582  D 08964 09904 3
2145             MLCS   @8&,FILE&6                     RESET FLAG  12  07594  D 09018 09897 3
2146             ML     %F5,FILE,W                     WRITE IN 6 BIT MODE  1C  07606  M %F5 09891 W
2147             BAI    *&1                                       7  07616  R 07623 G M
2148             ML     %F5,FILE,R                     CHECK FOR PROPER MODE  1C  07623  M %F5 09891 R
2149             BAI    *&1                                       7  07633  R 07640 G M
2150             BEX1   STACHK,M S                     GO REPORT ERROR  7  07640  R 03136 M S
2151   OTHER1    B      SWOFF                                     7  07647  J 06965
2152             LL     %F5,FILE,R                     READ THE ALTER TRK  1C  07654  L %F5 09891 R
2153             BAI    *&1                                       7  07664  R 07671 G M
2154             BEX1   *&&,M S                                   7  07671  R 07685 M S
2155             B      OTHER2                                    7  07678  J 07702
2156             ML     %F5,FILE,R                     READ ALTERNATE IN 6 BIT MODE  1C  07685  M %F5 09891 R
2157             BAI    *&1                                       7  07695  R 07702 G M
2158   OTHER2    BEX1   *&15,Y                         REPORT ERROR  7  07702  R 07723 Y
2159             BEX1   STACHK,7                                  7  07709  R 03136 7
2160             B      HA1CK                                     7  07716  J 07741
2161                 *** SET ERROR 11 ON ***
2162             SW     E11,NOGO&1                     TURN OFF ERROR IND  11  07723  , 01812 07809
2163       AFTER FLAGGING DEFECTIVE TRACK AND WRITTING HA1 ALTERNATE A READ
2164       HAC OP CAUSES A NO RECORD FOUND.
2165             B      MONITR                                    7  07734  J 02101
2166   HA1CK     BCE    BACKON,DATAFD&2,A  BRCH IF ALTER TRK SLECTED  12  07741  B 07771 09902 A
2167                 *** SET ERROR 12 ON ***
2168             SW     E12,NOGO&1                     TURN ON ERROR IND  11  07753  , 01813 07809
2169       AFTER FLAGGING BAD A READ OF THAT ADDRESS DOES NOT SELECT
2170       ALTERNATE TRACK
2171             B      MONITR                         GO IND ERROR  7  07764  J 02101
2172   BACKON    NOP                                              1  07771  N
2173             B      OESWON                                    7  07772  J 07004
2174             SW     BACKON&1                                  6  07779  , 07772
2175             MLCA   SAVADD,FILE&5                  RESTORE ADDR  12  07785  D 08894 09896 T
2176             ZA     &NC1,X2                        LOAD IX 2  11  07797  M 09014 00034 Q
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

2177      NCGC      NOPWM                                            1  07808  N
2178                B      *&28                                      7  07809  J 07843
2179      LETSGC    B      TYPI                                      7  07816  J 01593
2180                DCW    @TRCK FLGC CK@,G                         12  07834
2181                B      PRGCTL                                    7  07836  J 02273
2182                CW     NCGC&1                                    6  07843  D 07809
2183                    *** SET ERROR 13 CN ***
2184      &ALTRK    SW     E13                  TURN ON ERROR IND    6  07849  , 01814
2185        SELECTED ALTERNATE TRACK APPEARS TO BE DEFECTIVE
2186                B      MCNITR               GO REPORT ERROR      7  07855  J 02101
2187                B      PRGCTL               GO TO PROGRAM CONTROL 7 07862  J 02273
2188
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2190                       *** TEST ROUTINE DESCRIPTION ***
2191                     *** PREPARE ONE INSTRUCTION LOOP AND DATA FIELD ***
2192                     *** ACCORDING TO CE REQUEST ***
2193          WHEN THE CE SELECTS THE PROGRAM OPTION FOR ONE INSTRUCTION LOOP
2194        ING,THIS ROUTINE TAKES THE DATA ENTERED BY THE CE AND BUILDS THE
2195        DATA FIELD AND LOOP INSTRUCTION FROM IT.WHEN IT HAS COMPLETED
2196        THIS IT POSITIONS THE ACCESS TO THE ADDRESS ENTERED AND BRANCHES
2197        TO THE LOOP ROUTINE.
2198
2199      PREP        MLCA   226,RECADD          STORE LOOP DATA                  12  07869  D 00226 08919 1
2200                  CS     299                CLEAR CNTL FLD                    6  07881  / 00299
2201                  ZA     ADDR3,X1C          LOAD 1X 1C                       11  07887  M 08950 0C074
2202                  SW     DATAFD             CLEAR                             6  07898  , 09900
2203      CLEAN7      CS     C&X1C                   THE                          6  07904  / 0C..0
2204                  SER    X1C                        DATA                      7  07910  G 00074 8
2205                  BW     CLEAN7,DATAFD                   FIELD               12  07917  V 07904 09900 1
2206                  MLCE   XCTL1-1,LOOP&1     SET MODE & CHANNEL               12  07929  D 08896 01014 L
2207                  MLCS   XCTL1,LOOP&3       SET SPECIFIC OPER                12  07941  D 08897 01C16 3
2208                  MLCS   XCTL1&1,LOOP&9     SET MODIFIER                     12  07953  D 08898 01C22 3
2209                  ZA     NOFCHR,X8          LOAD IND REG 8                   11  07965  M 08912 0C064
2210                  ZA     NOFREC,WORK1       ADD NO. OF RECORDS               11  07976  M 08908 08927
2211                  A      &6&,NOFCHR         INCREASE CHAR COUNT              11  07987  A 09043 08912
2212                  M      NOFCHR,WORK2       RECORDS X CHARS                  11  07998  M 08912 08932
2213                  ZA     WORK2,X9           LOAD RESULT INTO IXS             11  08009  M 08932 0C069
2214                  MLCS   NOFCHR&1,DATAFD                                     12  08020  D 08913 09900 3
2215                  MLCS   BOSIC,LOOP&10      ALTER B-D-S-1-C OP               12  08032  D 08899 01C23 3
2216                  MLCA   HA2,FILE&7                                          12  08044  D 08905 09898 1
2217                  S      WORK2              RESET WORK 2                      6  08056  S 08932
2218                  BCE    LOOP,LOOP&3,0      BRCH IF SEEK OP                  12  08062  B 01013 01C16 C
2219                  MLCS   LOOP&1,*&2                                          12  08074  D 01014 08C87 3
2220                  SC     1,FILE             POSITION THE ACC                 10  08086  M %F0 09891 R
2221                  BCB1   *-16                                                7  08096  R 08086 2
2222                  BA1    *&1                                                 7  08103  R 08110 M
2223                  MLCS   LOOP&3,*&12        MOVE THE OP CODE                 12  08110  D 01016 08133 3
2224                  BCE    SRC,SPECCD,        IS THE OP CODE 1                 12  08122  B 08165 08924
```

```
                    PREPARE ONE INSTRUCTION LOOP AND DATA FIELD
PGLIN    LABEL      OPCOD  OPERAND
2225                BCE    TRC                 IS THE OP CODE 2
2226                BCE    HAC                 IS THE OP CODE 5
2227                BCE    TWA                 IS THE OP CODE 6
2228                BCE    WFC                 IS THE OP CODE 7
2229                B      PROCTL              SPCIFIC OP INCORRECT
2230     SRC        MLCA   RECADD,FILE67       LOAD REC ADDR
2231                SW     DATAFD&X8           LOAD
2232                MRCW   DATAFD,DATAFD&1              DATA
2233                MLCWS  @M@a,DATAFD&X8                 FIELD
2234                B      LOOP&1C
2235     TRC        S      @6@a,NOFCHR         RESET NOFCHR COUNT
2236                S      WORK2               RESET WORK AREA
2237                ZA     NOFREC,WORK1        LOAD WORK AREA
2238                M      NOFCHR,WORK2        RECORDS X CHARS
2239                ZA     WORK2,X9            LOAD RESULT INTO IX9
2240                SW     DATAFD&X9               THE
2241                MRCW   DATAFD,DATAFD&1             DATA
2242                MLCWS  @M@a,DATAFD&X9                 FIELD
2243                B      LOOP&1C
2244     HAC        A      @2@a,X9
2245                ZA     @OOOOO@a,X8         RESET IND REG 8
2246                SW     DATAFD&X9           LOAD
2247                MRCW   DATAFD,DATAFD&1             DATA
2248                MLCWS  @M@a,DATAFD&X9                 FIELD
2249                MRC    HA2-1,DATAFD        LOAD HA2 ADDR
2250     LOADDR     MLCA   RECADD,DATAFD&7&X8  LOAD
2251                S      @1@a,NOFREC             THE
2252                BZ     LOOP&1C
2253                A      NOFCHR,X8                    ADDR
2254                A      @1@a,RECADD                    IN
2255                B      LOADDR              THE DATA FLD
2256     TWA        SW     DATAFD&X9           LOAD
2257                MRCW   DATAFD,DATAFD&1             DATA
2258                MLCWS  @M@a,DATAFD&X9                 FIELD
2259                ZA     @OOOOO@a,X8         LOAD
```

```
                    DCOL          PAGE  68
CT   ADDRS  INSTRUCTION
 6   08134  B 08214
 6   08140  B 08301
 6   08146  B 08424
 6   08152  B 08524
 7   08158  J 02273
12   08165  D 08919 09898 I
 6   08177  , 09R00
12   08183  D 09900 09901 IM
12   08195  D 08968 09R00 7
 7   08207  J 01023
11   08214  S 09043 08912
 6   08225  S 08932
11   08231  SQM 08908 08927
11   08242  A 08912 08932
11   08253  ACM 08932 00069
 6   08264  , 09R+0
12   08270  D 09900 09901 IM
12   08282  D 08968 09R+0 7
 7   08294  J 01023
11   08301  A 08983 00069
11   08312  AQM 09048 00064
 6   08323  , 09R+0
12   08329  D 09900 09901 IM
12   08341  D 08968 09R+0 7
12   08353  D 08904 09900 M
12   08365  D 08919 09R07 1
11   08377  S 08970 08908
 7   08388  J 01023 V
11   08395  A 08912 00064
11   08406  A 08970 08919
 7   08417  J 08365
 6   08424  , 09R+0
12   08430  D 09900 09901 IM
12   08442  DQM 08968 09R+0 7
11   08454  AQM 09048 00064
```

```
                PREPARE ONE INSTRUCTION LOOP AND DATA FIELD
PGLIN   LABEL   OPCOD  OPERAND
2260    LCCADD  MLCA   RECADD,DATAFD&5&X8     THE
2261            S      @1@,NOFREC               RECORD
2262            BZ     LCCP&1C                          ,
2263            A      NOFCHR,X8              INTO
2264            A      @1@,RECADD               THE
2265            B      LCCADD                     DATA FIELD
2266    MFC     SW     DATAFD&7CCC
2267            MRC    DATAFD,DATAFD&1            FIELD
2268            MLCA   HAAREA,DATAFD&32   LOAD THE HA1 AREA OF THE FORMAT
2269            S      @6@,NOFCHR         RESET NO. OF CHAR
2270            ZA     NOFREC,MCRK1       DETERMINE THE END
2271            A      @1@,NOFCHR&1             ADDRESS AREAS
2272            SW     DATAFD&42
2273            MLCS   NOFCHR&1,DATAFD&56 LOAD THE LONG GAPS
2274            MLCB   DATAFD&56,DATAFD&55  OF THE FORMAT FIELD
2275            MLCS   DATAFD&56,DATAFD&84
2276            MLCS   DATAFD&56,DATAFD&7C  LOAD THE SHORT GAPS
2277            A      @5C@,NOFCHR        DETERMINE SIZE OF RECS IN FORMAT
2278            ZA     NOFCHR,X9                THE  FORMAT
2279    LCCFCR  MLCA   DATAFD&84,DATAFD&84&X9
2280            S      @1@,NOFREC
2281            BZ     *&19               BRCH IF ALL REC DON
2282            A      NOFCHR,X9
2283            B      LCCFCR
2284            MLCS   NOFCHR&1,DATAFD&42&X9  LOAD LAST GAP
2285            MLCWS  @M@,DATAFD&43&X9   TERMINATING WMGM
2286            B      LCCP&1C
```

```
CT  ADDRS  INSTRUCTION
12  08465  D 08919 09R05 T
11  08477  S 08970 08908
 7  08488  J 01023 V
11  08495  A 08912 0CC64
11  08506  A 08970 0891S
 7  08517  J 08465
 6  08524  , 16900
12  08530  D 09900 09901 #
12  08542  D 08877 09932 T
11  08554  S 09043 08912
11  08565  M 08908 08927
11  08576  A 08970 08913
 6  08587  , 09942
12  08593  D 08913 09956 3
12  08605  D 09956 09955 L
12  08617  D 09956 C9984 3
12  08629  D 09956 C997C 3
11  08641  A 09050 08912
11  08652  M 08912 0CC69
12  08663  D C9984 09RY4 T
11  08675  S 08970 08908
 7  08686  J 08711 V
11  08693  A 08912 0CC69
 7  08704  J 08663
12  08711  D 08913 09RU2 3
12  08723  D 08968 09RU3 7
 7  08735  J 01023
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2288                    DAC1C END TEST ROUTINE
2289                ***  END TEST ROUTINE  ***
2290     ENDTST     B      TYP1                                           7  08742  J 01593
2291                DCW    @INSURE CE-MAD & WRT FORMAT SWS ARE OFF@,G     38  08786
2292                H                              WAIT FOR ACTION        1  08788  .
2293                BW     SWOFF,CEMAD             TS CE-MAD SW ON       12  08789  W 06965 08832 1
2294                B      TYP1                    GO TYPE END MESG       7  08801  J 01593
2295                DCW    @PASS@,G                                       4  08811
2296                BCE    2CC0,TAC3,1             BRCH IF REPEATING     12  08813  B 02000 01C03 1
2297     TCP        H      4CC                     GO TO LOADER           6  08825  . 00400
2298                H                                                     1  08831  .
2299
2300     CEMAD      DC     @ @                                            1  08832
2301     LIMIT      DCW    @    @                                         4  08836
2302     ALPCDE     DCW    @76543210@                                     7  08843
2303     CPTNSW     DC     @ @                                            1  08844
2304     MAREA      DCW    @444444333333333333433333333333334@,G        33  08877
2305     TSTBIT     DCW    @ @                                            1  08879
2306     TRKCNT     DCW    @CC@                                           2  08881
2307     LCEND      DCW    @CCCCC@                                        4  08885
2308     SAVFLG     DCW    @CCCCCC@                                       5  08890
2309     SAVACC     DCW    @CCCCC@                                        4  08894
2310     LPDATA     DCW    @ @                                            1  08895
2311                DCW    @ @                                            1  08896
2312     XCTL1      DCW    @ @                                            1  08897
2313                DC     @ @                                            1  08898
2314     ECSIC      DCW    @ @                                            1  08899
2315     TKHD       DCW    @    @                                         4  08903
2316     HA2        DC     @  @                                           2  08905
2317     ACFREC     DCW    @   @                                          3  08908
2318     ACFCHR     DCW    @    @                                         4  08912
2319                DC     @ @                                            1  08913
2320     RECACC     DCW    @      @                                       6  08919
2321     SPECCC     DCW    @76521@                                        5  08924
2322     MCRK1      DCW    @CCC@                                          3  08927
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2323	WORK2	DC	a0CCCCa	5	08932	
2324	INTLCK	CCW	aMSaBa	3	08935	
2325	ADDR1	CCW	DATAFDC462C	5	08940	14520
2326	ADDR2	CCW	DATAFDC4577	5	08945	14477
2327	ADDR3	CCW	DATAFDC67CCC	5	08950	16900
2328	TENCNT	CCW	a0a	1	08951	
2329	CCCE3	CCW	a%R1a	3	08954	
2330		CCW	aCX2a	3	08957	
2331		CCW	aM33a	3	08960	
2332		CCW	a.14a	3	08963	
2333	FLGCHR	CCW	a a	1	08964	
2334		LTORG			08965	
2334			aNa	1	08965	
2334			a$a	1	08966	
2334			aLa	1	08967	
2334			aMa	1	08968	
2334			a a	1	08969	
2334			a1a	1	08970	
2334			aCC2C9a	5	08975	
2334			a3a	1	08976	
2334			a7a	1	08977	
2334			aCC237a	5	08982	
2334			a2a	1	08983	
2334			aCCa	2	08985	
2334			aCCCCa	4	08989	
2334			a12332a	4	08993	
2334			a57a	2	08995	
2334			aCC39a	4	08999	
2334			a9%6Ca	4	09003	
2334			a9%2Ca	4	09007	
2334			a4Ca	2	09009	
2334			NO1	5	09014	04896
2334			a4a	1	09015	
2334			a88a	2	09017	
2334			a8a	1	0901A	

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
2334                       @V@                              1  09019
2334                       @'@                              1  09020
2334                       NC3                              5  09025  05206
2334                       @45B4@                           4  09029
2334                       NIC                              5  09034  07201
2334                       @BB8A@                           4  09038
2334                       @BE8N@                           4  09042
2334                       @6@                              1  09043
2334                       @CCCCC@                          5  09048
2334                       @5C@                             2  09050
2335                 CRG   9851                                09851
2336      FILE       CCW   @CCCCCCBB@,C                     8  09891
2337      DATAFC     CC    @ @                              1  09900
2338                 CS    47CC                                14600
2339                 END   2CCC                                     J02000
```

END OF ASSEMBLY

6.23.00.0 DC02 RELIABILITY TEST DESCRIPTION

The program tests every available access and module on every channel in an automatic or manual mode. The automatic mode requires limited manual intervention, the manual mode requires more extensive intervention and can not be run unattended.

The normal sequence of the program starts by testing the Error Detection Ckts in the 7631. This is followed by 100 random seeks (using both accesses of the module) and verification that the access arrived at the correct location. At the CE cylinder (250) Read, Write, and Write Format are tested in 6 and 8 bit mode, the Read-Write test being performed on each of the 40 heads. The specific file operation; home address, full track with address, full track without addresses, single record, and cylinder, are tested for both read and write in the 8 bit mode. The cylinder op is tested only when in manual mode so that its availability can be checked. If the priority feature is available, a quick check of the seek complete line is made.

This is performed on every channel for every ready 1302 Access & Module. When all accesses have been tested, the test ends, if in automatic mode. If it is in manual mode, the program runs an overlap test where files and tapes on any channel are overlapped. When the overlap routine is completed, the test in manual mode is over.

6.23.01.0 OPERATING PROCEDURE

The standard procedures outlined in the package write-up apply to this program, in addition the following procedures are used to run this program.

01.1 SWITCH SETTINGS PREVIOUS TO RUNNING PROGRAM

a. HAO switch ON (on all 7631's to be tested)
b. All 1302 accesses not to be tested are set inoperative.
c. All other 7631-1302 switches OFF.

6.23.01.0 OPERATING PROCEDURE (continued)

01.2 SPECIAL REQUESTS

a. "Turn on Format & CE Wrt for this Acc & Mod"
CE turns on format Sw on the 1302 access & module that the program is about to test; also turn on CE Wrt switch on the 7631. Press Start to continue.

b. "CYO Available" (Manual Mode Only)
CE enters 1 if it is, 1 if it is not. (1 = any other character but 1.)

c. "CE-HAO ON"
Ce turns on CE-HAO switch and presses start. This request is made when during the random seek test the access does not arrive at the correct location. With the CE-HAO switch on, the HA1 is read into memory and displayed on the typewriter.

d. "Addr Read, 0000000, CE-HAO OFF"
The CE now turns off the CE-HAO switch and presses start to continue.

01.3 SPECIAL TADS

There is one special TAD for this program (memory location 01004).

If this TAD is set to a 1, the program will run in the manual mode. This TAD is set to a 1 when the program is loaded.

01.4 STANDARD OPTIONS

All the standard program options are available in this program.

01.5 MANUAL MODE

When running in the manual mode, all channels which have tapes, but do not have files should have a scratch tape loaded and ready on Drive "1". This is required for proper operation of the overlap test.

01.6 SUMMARY TYPEOUT

The summary typeout as described in the package write-up is given at the end of this test.

6.23.02.0 OPERATING HINTS

02.1 SELECTING MANUAL MODE (Alter Special TAD)

Use program option code 2 (alter memory) to alter the special TAD to a 1 or 1. Special TAD location is 01004.

02.2 RELIABILITY RUN

To run the program in a reliability mode:

1. Run program in automatic mode.
2. Alter TADS (select option code 3) to repeat test.
3. Terminate program when desired (select option code blank).

02.3 ALTER ROUTINE SEQUENCE

If this program option is selected, card should be used to insure that the format required by certain routines is available when the routine is run in the altered sequence.

6.23.03.0 PROGRAM STOPS

03.1 ERROR STOPS

None

03.2 NORMAL STOPS - Manual Mode Only

Mem Loc	Reason
07773	Wait for CE to turn on CE Wrt, and Format Switches.
05644	Wait for CE to turn on CE-HAO switch, press start.
05728	Wait for CE to turn off CE-HAO switch, press start.

6.23.04.0 TYPEOUTS (Other than request or standard typeouts)

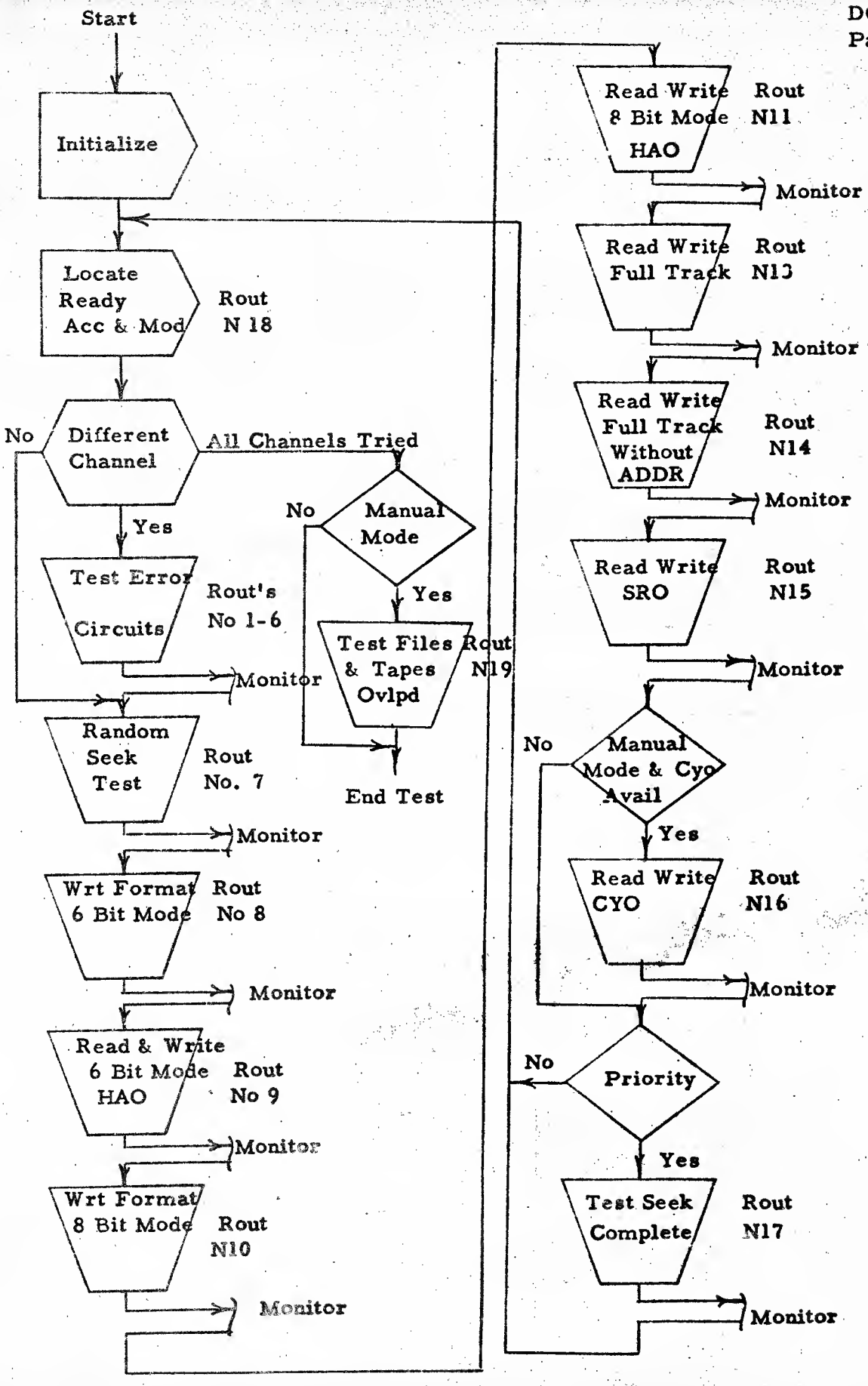
04.1 "TST ACC x MOD x CH x"

This tells the CE which access and module on which channel is about to be tested.

TEST TERMINATED WITH INSTR CK. 04816 - SUCCESSFUL

6.23.05.0 FLOW CHART

The following flow chart is designed to give a general picture of the test routine's relationship to one another.


Start
Initialize
Locate Ready Acc & Mod
Rout N 18
No
Different Channel
All Channels Tried
Yes
Test Error Circuits
Rout's No 1-6
Monitor
Random Seek Test
Rout No. 7
Monitor
Wrt Format 6 Bit Mode
Rout No 8
Monitor
Read & Write 6 Bit Mode HAO
Rout No 9
Monitor
Wrt Format 8 Bit Mode
Rout N10
Monitor
No
Manual Mode
Yes
Test Files & Tapes Ovlpd
Rout N19
End Test
Read Write 8 Bit Mode HAO
Rout N11
Monitor
Read Write Full Track
Rout N13
Monitor
Read Write Full Track Without ADDR
Rout N14
Monitor
Read Write SRO
Rout N15
Monitor
No
Manual Mode & Cyo Avail
Yes
Read Write CYO
Rout N16
Monitor
No
Priority
Yes
Test Seek Complete
Rout N17
Monitor

6.23.06.0 ROUTINE/ERROR INDEX DC02

To locate routines and errors in the program listing.

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1002                CTL    2
1003
1004                DEFINE STANDARD TACS                  **
1005
1006                ORG    1000                             **          01000
1007      TAD0      DCW    @ @                                      1  01000
1008      TAD1             @ @                                      1  01001
1009      TAD2             @ @                                      1  01002
1010      TAD3                                                      1  01003
1011                                                         **
1012                DEFINE SPECIAL TADS
1013                                                         **
1014      SPTAC0    DCW    @ @                                      1  01004
1015      SPTAC1           @ @                                      1  01005
1016      SPTAC2           @ @                                      1  01006
1017      SPTAC3           @ @                                      1  01007
1018      SPTAC4           @ @                                      1  01008
1019      SPTAC5           @ @                                      1  01009
1020      SPTAC7           @ @                                      1  01010
1021      SPTAC8           @ @                                      1  01011
1022      SPTAC9           @ @                                      1  01012
1023
```

```
PGLIN     LABEL     OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1C25                       *** I/C DICOST PROGRAM ***
1C26                   *** ONE INSTRUCTION LOOP ROUTINE ***
1C27          WHEN THE CE SELECTS A ONE INSTRUCTION LOOP THE I/O INSTRUCTION
1C28          IN THIS ROUTINE IS ALTERED AND THE LOOP IS ENTERED.NOTE THAT THE
1C29          BRANCH ON INQUIRY INSTRUCTION IS THE ONLY EXIT FROM THE LOOP.
1C30      LOOP      MU     811,0,R          I/O INST BEING LUP D   10  01013  M 811 00000 R
                                                                                      G
1C31                BAI    *E1                                      7  01023  R 01030 M
1C32                BNQ    PRGCTL           BRCH ON INQ TO PRGCL    7  01030  J 02285 Q
1C33                B      LOOP             CONTINUE TO LOOP        7  01037  J 01013
1C34                H                                               1  01044  .
1C35
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1037                   *** I/O DICOST PROGRAM ***
1038                *** CHANNEL ALTER ROUTINE ***
1039          THIS ROUTINE ALTERS ALL I/O INSTRUCTIONS,BRANCH-ON-STATUS-
1040        INDICATOR-ON INSTRUCTIONS,AND BRANCH ON CHANNEL OVERLAP IN PRO-
1041        CESS INSTRUCTIONS ACCORDING TO THE CHANNEL INDICATED.THIS IS DONE
1042        BY SCANNING A DEFINED AREA OF MEMORY AND ALTERING THESE INSTRUC-
1043        TIONS.
1044
1045      CHALTR    SBR    X5          STORE ADDR                    7  01045  G 00049 B
1046                MLCA   9&X5,X7     LOAD IX6 & IX7               12  01052  D 00#9 00059 T
1047      SCAN      SCNLA  0&X6,0&X6   SCAN FOR WM                   12  01064  D 00#.0 00#.0 S B
1048                SAR    X6          STORE ADDR OF OPER            7  01076  G 00054 A
1049                C      X6,X7       HAS ALL OF FLD BEEN          11  01083  C 00054 00059
1050                BE     13&X5       SEARCHED IF SO BRCH           7  01094  J 00#/3 U
1051                MLCS   1&X6,*&12   STORE OP CODE                 12  01101  D 00#.1 01124 3
1052                BCE    MLCRU,CODES, IS OP CODE M                12  01113  B 01149 02785
1053                BCE                IS OP CODE L                  1  01125  B
1054                BCE                IS OP CODE U                  1  01126  B
1055                BCE    RX3OR1      IS OP CODE R                  6  01127  B 01168
1056                BCE                IS OP CODE X                  1  01133  B
1057                BCE                IS OP CODE 3                  1  01134  B
1058                BCE                IS OP CODE 1                  1  01135  B
1059                BCE    JAY         IS OP CODE J                  6  01136  B 01187
1060                B      SCAN        GO FIND NEXT OPER             7  01142  J 01064
1061      MLCRU     MLCS   10&X5,2&X6   CHEANGE CH-MODE CHAR         12  01149  D 00#/0 00#.2 3
1062                B      SCAN        GO FIND NEXT OPER             7  01161  J 01064
1063      RX3OR1    MLCS   11&X5,1&X6   CHANGE B-I-S-I-O OP          12  01168  D 00#/1 00#.1 3
1064                B      SCAN        GO FIND NEXT OPER             7  01180  J 01064
1065      JAY       MLCS   7&X6,*&12    STORE MODIFIER               12  01187  D 00#.7 01210 3
1066                BCE    ONE234,MODS, IS MODIFIER A 1              12  01199  B 01221 02789
1067                BCE                IS MODIFIER A 2               1  01211  B
1068                BCE                IS MODIFIER A 3               1  01212  B
1069                BCE                IS MODIFIER A 4               1  01213  B
1070                B      SCAN        GO FIND NEXT OPER             7  01214  J 01064
1071      ONE234    MLCS   12&X5,7&X6   CHANGE BOL MODIFIER          12  01221  D 00#/2 00#.7 3
1072                B      SCAN        GO FIND NEXT OPER             7  01233  J 01064
1073                H                                                1  01240  .
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
1074
1075
1076                DEFINE SYSTEM & CHANNEL CONTROL CARDS
1077
1078                ORG    1233                                            01233
1079                DCW    @FP6FMLFMTFMC381/2@                        17   01249
1080                                                  **
1081                DEFINE PROGRAM TITLE
1082                                                  **
1083                ORG    1250                                            01250
1084                DCW    @DC02B@,G                                   5   01254
1085
1086                LOCATE THE SYSTEM & CHANNEL CARDS
1087
1088                ORG    1256                                            01256
1089      SYSTEM    DC     @                                  @        50  01256
1090                       @      @                                    7   01312
1091                ORG    1289                                            01289
1092      CHNL1     DC     @                                  @        50  01289
1093                       @      @                                    7   01345
1094                ORG    1346                                            01346
1095      CHNL2     DC     @                                  @        50  01346
1096                       @      @                                    7   01402
1097                ORG    14C3                                            01403
1098      CHNL3     DC     @                                  @        50  01403
1099                       @      @                                    7   01459
11C0                ORG    1460                                            01460
11C1      CHNL4     DC     @                                  @        50  01460
11C2                       @      @                                    7   01516
11C3
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1105                    *** I/O DICOST PROGRAM ***
1106                 *** TYPE AND REQUEST FOR INTERVENTION ***
1107          THIS ROUTINE IS USED TO TYPE ALL MESSAGES AND REQUESTS FOR
1108        MANUAL INTERVENTION.THE ROUTINE WILL TYPE A MESSAGE FROM A COMMON
1109        DATA FIELD,OR THE MESSAGE MAY BE LOCATED IMMEDIATELY AFTER THE
1110        BRANCH INSTRUCTION TO THIS ROUTINE.IF A REPLY IS REQUIRED A READ
1111        CONSOLE PRINTER OPERATION IS ISSUED.THIS ROUTINE IS USED TO TYPE
1112        ALL MESSAGES IN THIS PROGRAM.
1113
1114    TYMES    SBR    TYPXIT&5          STORE RETURN ADDR                 7  01517  G 01591 B
1115    TYPB     WCP    201               TYPE MESSAGE                     10  01524  M %TO 00201 W
1116             BEX1   *-16,S,M          BRCH ON ANY BUT WLR               7  01534  R 01524 S,M
1117             BA1    *&1                                                 7  01541  R 01548 G,M
1118    SW11     NOPWM                                                      1  01548  N
1119    LA860    RCP    0                 READ CONSOLE PRINTER             10  01549  M %TO 00000 R
1120             BEX1   *-16,S,M          BRCH ON ANY BUT WLR               7  01559  R 01549 S,M
1121             BA1    *&1                                                 7  01566  R 01573 G,M
1122             CW     SW11&1            TURN OFF SWITCH 11                6  01573  ¤ 01549
1123             CS     33C               CLEAR PRINT AREA                  6  01579  / 00330
1124             CS                                                         1  01585  /
1125    TYPXIT   B      0                 RETURN TO DICOST                  7  01586  J 00000
1126    TYP1     SBR    X1                STORE ADDR OF MESG                7  01593  G 00029 B
1127             B      *&14                                                7  01600  J 01620
1128    TYP2     SBR    X1                STORE ADDR OF MESG                7  01607  G 00029 B
1129             SW     REPLY&1           TURN ON REPLY SW                  6  01614  , 01652
1130             WCP    0&X1              TYPE MESSAGE                     10  01620  M %TO 000*0 W
1131             SBR    X5                SAVE ADDRESS                      7  01630  G 00049 B
1132             BEX1   *-23,S,M          BRCH ON ANY BUT WLR               7  01637  R 01620 S,M
1133             BA1    *&1                                                 7  01644  R 01651 G,M
1134    REPLY    NOPWM                    BRCH                              1  01651  N
1135             B      RDCON             IF REPLY REQUIRED                 7  01652  J 01666
1136             B      0&X5              RETURN                            7  01659  J 00**0
1137    RDCON    RCP    0&X5              REPLY TO MESSAGE                 10  01666  M %TO 00**0 R
1138             SBR    X1                SAVE ADDR                         7  01676  G 00029 B
1139             BEX1   *-23,S,M          BRCH ON ANY BUT WLR               7  01683  R 01666 S,M
1140             BA1    *&1                                                 7  01690  R 01697 G,M
1141             CW     REPLY&1                                             6  01697  ¤ 01652
```

```
PGLIN   LABBL    OPCOD  OPERAND                                                    CT  ADDRS  INSTRUCTION

1142             B      0&X1            RETURN                                      7  01703  J 000+0
1143    DATA     MLCWS  @N@,PASS1       RESET FIRST PASS INST                      12  01710  D 10614 01944 7
1144             BCE    *&13,1264,1     BRCH IF PRIORITY AVAILABLE                 12  01722  B 01746 01264 1
1145             MLCWS  @N@,MONITR&7    ALTER PRIORITY INST TO NO-OP               12  01734  D 10614 02108 7
                                                                                                            D
1146             MRCWG  *&9,1230        RESTORE CHANNEL ALTER ROUTINE              12  01746  D 01766 01230 L
1147             B      PASS1&7                                                     7  01758  J 01951
1148             H                                                                  1  01765  .
1149             DC     @.73@                                                       3  01768
1150             DCW    @J@                                                         1  01769
1151             DC     SCAN                                                        5  01774  01064
1152             DC     @ @                                                         1  01775
1153             DCW    @.@.G                                                       1  01776
1154             DS     12                                                             01789
1155
1156             *** ERROR TABLES THESE ARE USED FOR ERROR ***
1157             *** SUMMARIES AND ERROR INDENTIFICATION ***
1158
1159             ORG    *&X00                                                          01800
1160             ORG    *&1                                                            01801
                         D
1161    STPTAB   DCW    @L@                                                         1  01801
1162    E1       DC     @ @                                                         1  01802
1163    E2              @ @                                                         1  01803
1164    E3              @ @                                                         1  01804
1165    E4              @ @                                                         1  01805
1166    E5              @ @                                                         1  01806
1167    E6              @ @                                                         1  01807
1168    E7              @ @                                                         1  01808
1169    E8              @ @                                                         1  01809
1170    E9              @ @                                                         1  01810
1171    E10             @ @                                                         1  01811
1172    E11             @ @                                                         1  01812
1173    E12             @ @                                                         1  01813
1174    E13             @ @                                                         1  01814
1175    E14             @ @                                                         1  01815
1176    E15      DC     @ @                                                         1  01816
117     16              ?                                                              0181
1178    E17             @ @                                                            0181
1179    E18             @ @                                                         1  01819
```

PGLIN	LABEL	I/O DICOST TYPE OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1180	E19		â â	1	01820	
1181	E20		â â	1	01821	
1182	E21		â â	1	01822	
1183	E22		â â	1	01823	
1184	E23		â â	1	01824	
1185	E24		â â	1	01825	
1186	E25	DC	â â	1	01826	
1187	E26	DC	â â	1	01827	
1188	E27		â â	1	01828	
1189	E28		â â	1	01829	
1190	E29		â â	1	01830	
1191	E30		â â	1	01831	
1192	E31		â â	1	01832	
1193	E32		â â	1	01833	
1194	E33		â â	1	01834	
1195	E34		â â	1	01835	
1196	E35		â â	1	01836	
1197	E36		â â	1	01837	
1198	E37		â â	1	01838	
1199	E38		â â	1	01839	
1200	E39		â â	1	01840	
1201	E40		â â	1	01841	
1202	E41		â â	1	01842	
1203	E42		â â	1	01843	
1204	E43		â â	1	01844	
1205	E44		â â	1	01845	
1206	E45		â â	1	01846	
1207	E46		â â	1	01847	
1208	E47		â â	1	01848	
1209	E48		â â	1	01849	
1210	E49		â â	1	01850	
1211	E50		â â	1	01851	
1212	E51	DC	â â	1	01852	
1213	E52		â â	1	01853	
1214	E53		â â	1	01854	
1215	E54		â â	1	01855	
1216	E55		â â	1	01856	
1217	E56		â â	1	01857	

```
PGLIN     LABBL     OPCOD  OPERAND          CT  ADDRS  INSTRUCTION
1218      ERRTAB    DC     2#3               1  01858
1219                DC     3 3               1  01859
1220
```

```
PGLIN     LABBL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1222                ***  INITIALIZE RCUTINE FOR THE DICOST PROGRAM ***
1223      INITLE    WCP    1250                PRINT TITLE          10  01860  M &TO 01250 W
1224                BCB1   *-16                                      7  01870  R 01860 2
1225                BA1    *&1                                       7  01877  R 01884 M
1226                CS     99                  RESET IND REG S      6  01884  / 00099
1227                SW     25                  SET WM IN IND REG 1  6  01890  , 00025
1228                MLCS   a+a,100             PREPARE TO LOAD 2-15 12  01896  D 10615 00100 3
1229                MRWR   25,30               LOAD IND REG 2-15    12  01908  0 00025 00030 &
1230                MRCWG  RESUME,1            MOVE RESET PROCEDURE 12  01920  D 02015 00001 D
1231                MRCWG  INTR,101            MOVE INTERUPT PROC   12  01932  0 02007 00101 L
1232      PASS1     B      DATA                GO DO  MORE INITIALIZING  7  01944  J 01710
1233           OPT2 CW     NOERSW&1            TURN OFF SWITCHES    6  01951  ¤ 02875
1234                CW     LPRT,SW11&1                              11  01957  ¤ 02799 01549
1235           OPT1 CW     SECSW                                    6  01968  ¤ 02798
1236                CS     E5&                 CLEAR AND RESET      6  01974  / 01857
1237                MLCWS  aLa,STPTAB           ERROR TABLE         12  01980  D 10616 01801 7
1238                B      START               GO TO ROUTINE INIT.  7  01992  J 04123
1239
1240                H                                               1  01999  .
1241                ORG    2CC0                                        02000
1242                B      INITLE                                   7  02000  J 01860
1243                ***  RESET & INTERUPT ROUTINES,THESE ROUTINES ***
1244                *** ARE MOVED TO LCCATIONS 1 & 101
1245      INTR      BRQ    PRGCTL              RETURN TO PROG CNTRL  7  02007  J 02285 Q
1246                DCW    aMa                                      1  02014
1247      RESUME    B      CKLUP                                    7  02015  J 02023
1248                DCW    aMa                                      1  02022
1249      CKLUP     BW     MONITR,LPRT         CHECK FOR LOOP ROUT  12  02023  V 02101 02799 1
1250                BW     LOOP,LPINST         CHECK INST LOOP SW   12  02035  V 01013 02800 1
1251                CW     SW11&1,EXTRA&1      CLEAR TYPE SWITCHES  11  02047  ¤ 01549 03252
1252                CW     REPLY&1                                  6  02058  ¤ 01652
1253                CS     E5&                 RESET ERROR TABLE    6  02064  / 01857
1254                MLCWS  aLa,STPTAB                               12  02070  D 10616 01801 7
1255                MLNA   X3,X2               LOAD IX 2            12  02082  0 00039 00034 /
1256                B      MONITR&7            GO TO MONITR         7  02094  J 02108
1257
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1259			*** I/O DICOST PROGRAM ***				
1260			*** MONITOR ROUTINE *** .				
1261			THE MONITOR IS ENTERED AFTER EVERY TEST ROUTINE IS COMPLETED,OR				
1262			A STATUS ERROR HAS BEEN DETECTED AND INDICATED.IN THE CASE OF A				
1263			STATUS ERROR MONITOR SIMPLY BRANCHES BACK TO THE POINT AT WHICH				
1264			THE STATUS ERROR WAS DETECTED.WHEN ENTERED FROM THE END OF A				
1265			TEST ROUTINE MONITOR CHECKS TO SEE IF THE CE PRESSED INQUIRY,THE				
1266			ROUTINE IS BEING LOOPED,ANY ERRORS OCCURED ALTER ROUTINE SEQUENCE				
1267			IS SELECTED,OR THE NEXT SEQUENCIAL ROUTINE SHOULD BE RUN.				
1268							
1269	MONITR	SBR	X2	STORE ADDR	7	02101	G 00034 B
1270		BXPA	*&1	EXIT ALERT MODE	7	02108	Y 02115 X
1271		BNQ	PRGCTL	WAS THERE AN INQ	7	02115	J 02285 Q
1272	MONIT1	BW	0&X3,LPRT	RETURN IF LOOPING RT	12	02122	V 000M0 02799 1
1273	MONIT2	MLCWS	aMa,224	SET WMGM SHORT MESG	12	02134	D 10617 00224 7
1274		B	ERRCTL		7	02146	J 02876
1275	MONIT3	NOP			1	02153	N
1276	OPT1	BW	SEQCTL,SEQSW	GO TO SEQ CONTROL	12	02154	V 03681 02798 1
1277		MLCWA	X2,X3	LOAD IX3	12	02166	D 00034 00039 X
1278		MLCWS	a a,224	CLEAR WMGM	12	02178	D 10618 00224 7
1279		B	0&X2	GO TO NEXT ROUTINE	7	02190	J 000.0
1280	WHERE2	MLCWS	*-12,224	CLEAR WMGM	12	02197	D 02196 00224 7
1281		BCE	*&8,0&X2,N	BRCH IF ROUT COMP	12	02209	B 02228 000.0 N
1282		B	0&X2	RETURN TO ROUTINE	7	02221	J 000.0
1283		BZN	*&8,1&X2,2	BRCH IF CHAR IS NUMR	12	02228	V 02247 000.1 2
1284		B	0&X2	RETURN TO ROUTINE	7	02240	J 000.0
1285		BZN	*&8,2&X2,2	BRCH IF CHAR IS NUMR	12	02247	V 02266 000.2 2
1286		B	0&X2	RETURN TO ROUTINE	7	02259	J 000.0
1287		BW	MONIT3,3&X2	BRCH IF CHAR HAS WM	12	02266	V 02153 000.3 1
1288		B	0&X2	RETURN TO ROUTINE	7	02278	J 000.0
1289							

```
PGLIN  LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1291                  *** I/O DICOST PROGRAM ***
1292                ***       PROGRAM CONTROL       ***
1293          WHEN THE CE PRESSES INQUIRY TO SELECT A STANDARD PROGRAM OPTION
1294        THIS ROUTINE IS ENTERED.THE CE ENTERS ON THE TYPEWRITER THE
1295        OPTION CODE DESIRED,ALONG WITH THE DATA NEEDED BY THE OPTION.THE
1296        ROUTINE DETERMINES WHICH OPTION HAS BEEN SELECTED AND INITIATES
1297        THE OPTION.
1298
1299   PRGCTL       RCPW   CTLFLD              READ THE CONSOLE PRT          10  02285  L %TO 00201 R
1300                SBR    X1                                               7  02295  G 00029 BS
1301                BEX1   PRGCTL,SM          BRCH ON ANY BUT WLR           7  02302  R 02285 SM
1302                SW     CTLFLO&1                                         6  02309  , 00202
1303                BAI    *&1                                              7  02315  R 02322 GM
1304          OPT1  CW     SEQSW              TURN OFF SEQ SWITCH           6  02322  ¤ 02798
1305                CW     LPRT,LPINST        TURN OFF LOOP SWS            11  02328  ¤ 02799 02800
1306                MLWS   *,E1               CLEAR WM IN ERROR            12  02339  D 02350 01802 4
1307                MRWR   E1,E2                 TABLE                      12  02351  D 01802 01803 %
1308                MLCS   CTLFLO,*&12         MOVE CTL CODE ENTERO         12  02363  D 00201 023B6 3
1309                BCE    ENDTST,CTLCOD,      IS CTL CODE BLANK            12  02375  B 09288 02797
1310                BCE    ALTADS              IS CTL CODE 1                 6  02387  B 02436
1311                BCE    ALTMEM              IS CTL CODE 2                 6  02393  B 02459
1312          OPT1  BCE    ALTSEQ             IS CTL CODE 3                  6  02399  B 02506
1313                BCE    LUPRT               IS CTL CODE 4                 6  02405  B 02559
1314                BCE    ONELUP              IS CTL CODE 5                 6  02411  B 02588
1315                BCE    RSTART              IS CTL CODE 6                 6  02417  B 02622
1316                BCE    CONT                IS CTL CODE 7                 6  02423  B 02645
1317                B      PRGCTL                                           7  02429  J 02285
1318   ALTADS       MLCA   CTLFLO&4,1C03       MOVE IN NEW TADS             12  02436  D 00205 01003 T
1319                CS     MONIT1,299          CLEAR OUT CTL FLD            11  02448  / 02122 00299
1320   ALTMEM       MLCA   CTLFLD&5,*&9        MOVE ADDR TO BE ALTR         12  02459  D 00206 02479 T
1321                RCPW   0                  ALTER MEMORY                 10  02471  L %TO 00000 R
1322                BEX1   *-16,SM            CHECK ALL BUT WLR             7  02481  R 02471 SMG
1323                BAI    *&1                                              7  02488  R 02495 GM
1324                CS     MONIT1,299          CLEAR THE CNTRL FLD          11  02495  / 02122 00299
1325   ALTSEQ       MLCWS  @MG,O&X1            SET WMGM AT END              12  02506  D 10617 000*0 7O
1326          OPT1  MRCWG  CTLFLD&1,SEQFLO     MOVE CNTRL TO SEQ            12  02518  D 00202 02668 L
1327          OPT1  SW     SEQSW               TURN ON SEQ SWITCH            6  02530  , 02798
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1328		CPT1 MLNA	SQCON1,X4	LOAD IND REG4	12	02536	D 02773 00044 /
1329		CPT1 CS	MONIT2,299	CLEAR CNTRL FLD	11	02548	/ 02134 00299
1330	LUPRT	SW	LPRT	TURN ON LOOP SWITCH	6	02559	, 02799
1331		MLNA	CTLFLD&5,X2	LOAD IND REG2	12	02565	D 00206 00034 /
1332		CS	MONIT2,299	CLEAR CNTRL FLD	11	02577	/ 02134 00299
1333	CNELUP	SW	LPINST	TURN ON LOOP INST SW	6	02588	, 02800
1334	LUPINT	NOPWM		THIS SW IS TURNED ON	1	02594	N
1335		B	*&8	BY ERRCTL	7	02595	J 02609
1336		B	PREP	GO TO PREPARE ROUT	7	02602	J 09378
1337		CW	LUPINT&1	TURN OFF SW	6	02609	¤ 02595
1338		B	LOOP		7	02615	J 01013
1339	RSTART	MLNA	CTLFLD&5,X2	LOAD IND REG2	12	02622	D 00206 00034 /
1340		CS	MONIT2,299	CLEAR CNTRL FLD	11	02634	/ 02134 00299
1341	CONT	CS	WHERE2,299	CLR CNTL FLD	11	02645	/ 02197 00299
1342							
1343		I/O DICOST CONSTANTS					
1344	STACNTCPT2	DCW	a0Ca		2	02657	
1345		CPT2	a0Ca		2	02659	
1346		CPT2	a0Ca		2	02661	
1347		CPT2	a0Ca		2	02663	
1348		CPT2	a0Ca		2	02665	
1349		CPT2	a0Ca		2	02667	
1350	SECFLDCPT1	DCW	a a		1	02668	
1351		CPT1 DC	a	a	37	02705	
1352		CPT1 DC	a	a	37	02742	
1353		CPT1 DC	a	a,G	25	02767	
1354	SQCON1CPT1	DCW	SECFLD		5	02773	02668
1355	CMPFLDCPT1	DCW	aN a		4	02777	
1356	CODES	DCW	aJ13XRULMa		8	02785	
1357	MODS	DCW	a4321a		4	02789	
1358		DCW	a7a		1	02790	
1359		DC	a6a		1	02791	
1360			a5a		1	02792	
1361			a4a		1	02793	
1362		CPT1	a3a		1	02794	
1363			a2a		1	795	
1364			a1a		1	02796	

```
PGLIN     LABEL       OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1365      CTLCCD              @ @                               1  02797
1366      SEQSW OPT1  DC      @ @                               1  02798
1367      LPRT        DC      @ @                               1  02799
1368      LPINST      DC      @ @                               1  02800
1369      ADDRC2      DCW     ERRTAB           ADDR OF ERR TABLE  5  02805  01050
1370      ADDRC3OPT2  DCW     STACNT           ADDR OF STATUS TABLE  5  02810  02657
1371      ERR         DCW     @*ERROR@                           6  02816
1372       ACTION     DC      @REQ ERROR ACTION@,G              16  02817
1373      ERCODE      DCW     @547P@                             4  02837
1374       SAVIND     DCW     @1 2 4 8 A B@,G                   11  02838
1375       STIND      DC      @1 2 4 8 A B@,G                   11  02850
1376      STACCOPT2   DCW     @NR@                               2  02863
1377           CPT2   DCW     @BY@                               2  02865
1378           CPT2   DCW     @DC@                               2  02867
1379           CPT2   DCW     @EC@                               2  02869
1380           CPT2   DCW     @NT@                               2  02871
1381           CPT2   DCW     @WL@                               2  02873
1382       NOERSW     DC      @ @                                2  02874
1383
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1385                   *** I/C DICOST PROGRAM ***
1386                ***       ERROR CONTROL       ***
1387          THIS ROUTINE DETERMINES IF ANY STATUS ERRORS OR PROGRAM DETECT-
1388        ED ERRORS HAVE TO BE INDICATED,IF THERE ARE THIS ROUTINE BUILDS
1389        THE ERROR MESSAGE AND HAS IF TYPED OUT.THIS ROUTINE ALSO CHECKS
1390        TAC 1 TO SEE IF A REQUEST FOR ERROR ACTION SHOULD BE MADE.
1391
1392                LOCATE FAILING INST
1393
1394     ERRCTL     MLCA   X2,X5             LOAD INO REG 5           12  02876  D 00034 00049 T
1395                S      @1@,X5                                    11  02888  S 10619 00049
1396                SCNLA  0&X5,0&X5         SCAN THE ROUTINE         12  02899  D 00**0 00**0 S
                                                                                                 8
1397                SAR    X5                STORE CHAR ADDR           7  02911  G 00049 A
1398                MLCS   1&X5,*&12         MOVE CHAR TO BE CHKD     12  02918  D 00**1 02941 3
1399                BCE    GOTONE,CODES,     IS OP CODE M             12  02930  B 02974 02785
1400                BCE                      IS OP CODE L              1  02942  B
1401                BCE    SHORT1            IS OP CODE U              6  02943  B 02993
1402                C      X3,X5             HAS ROUTINE BEEN         11  02949  C 00039 00049
1403                BL     LOOPLO             SEARCHED                 7  02960  J 03017 T
1404                B      ERRCTL&12         GO CONTINUE THE SRCH      7  02967  J 02888
1405     GOTONE     MLCWA  10&X5,LOOP&9      LOAD THE LOOP INST       12  02974  D 00*/0 01022 X
1406                B      LOOPLO                                     7  02986  J 03017
1407     SHORT1     MLCWA  5&X5,LOOP&9       LOAD THE LOOP INST       12  02993  D 00**5 01022 X
1408                MLCS   @N@,LOOP          SET NO-OP FOR SHORT      12  03005  D 10614 01013 3
1409                                       INSTRUCTION
1410     LOOPLO     MLCA   LOOP&9,234        MOVE FAILING OPER        12  03017  D 01022 00234 T
1411                MLNA   X3,223            MOVE ADDR OF ROUT        12  03029  D 00039 00223 /
1412          CPT2 SW     NOERSW&1          TURN OFF NO ERR SW        6  03041  , 02875
1413                ZA     ADDR02,X1         LOAD NO REG 1            11  03047  DQM 02805 00029
1414                ZA     @OC209@,X5        LOAD INO REG 5           11  03058  DQM 10624 00049
1415                    SCAN ERROR TABLE & UPDATA ERROR COUNT
1416     ERSCAN     SCNLA  0&X1,0&X1         SCAN THE ERROR TABLE     12  03069  D 000*0 000*0 S
                                                                                                 8
1417                SAR    X1                STORE ADDR                7  03081  G 00029 A
1418                BCE    AFTSRH,1&X1,L     HAS TABLE BEEN COMP.     12  03088  B 03170 000*1 D
                                                                                                 L
1419                SW     X1-1             DEFINE ERROR              6  03100  , 00028
1420                MLNWA  X1,0&X5           MOVE ERROR CODE NO.      12  03106  D 00029 00**0 V
1421          CPT2 A      @1@,1&X1          UPDATE ERROR COUNT        11  03118  A 10619 000*1
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PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1422                A      @3@,X5            UPDATE IND REG 5  11  03129  A 10625 00049
1423          OPT2  BCE    SUMARY,1&X1,9     BRCH IF ERROR OCCURED 12 03140  B 04078 000#1 9
1424                                  NINE TIMES
1425                CW     1&X1,X1-1         CLEAR WM S        11  03152  ¤ 000#1 00028
1426                B      ERSCAN                               7  03163  J 03069
1427                    LOAD PRINT FIELD WITH ERROR MESG
1428      ARTSRH    BCE    WHERE2,1000,1     BRCH,NO MESG. IND 12  03170  B 02197 01000 1
1429      ERROSW    NOP                                         1  03182  N
1430                BCE    WHERE2,209        BRCH IF NO ERRORS 12  03183  B 02197 00209
1431                SW     ERROSW&1          RESET ERROR SW    6  03195  , 03183
1432                MLCA   ERR,206           MOVE ERROR        12  03201  D 02816 00206 T
1433                MLCA   2&X3,RCUTID       MOVE ROUTINE IDENT 12 03213  D 000M2 03242 T
                                                                          Q
1434                B      TYP1              GO TYPE ROUTINE ID 7  03225  J 01593
1435                OCW    @RCUTINE @                           8  03239
1436      ROUTID    OC     @   @,G                              3  03242
1437                B      TYPES                                7  03244  J 01517
1438                    TYPE ADDITIONAL  ERROR INFORMATION
1439      EXTRA     NOPWM                                       1  03251  N
1440                WCP    DATA              PRINT EXTRA DATA  10  03252  H %T0 01710 W
1441                BCB1   *-16                                 7  03262  R 03252 2
1442                BA1    *&1                                  7  03269  R 03276 M
                                                                          C
1443                CW     EXTRA&I                              6  03276  ¤ 03252
1444      ACT       BCE    *&8,1001,1        LOOP ACTION REQUIRED 12 03282  B 03301 01001 1
1445                B      WHERE2                               7  03294  J 02197
1446                SW     LUPINT&1          TURN ON SWITCH    6  03301  , 02595
                                                                                D
1447                MRCWG  ACTION,201        MOVE ACTION MESG  12  03307  D 02817 00201 L
1448                B      TYPES                                7  03319  J 01517
1449                B      PRGCTL                               7  03326  J 02285
```

ERROR CONTROL-CHECK STATUS INDICATORS

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1451			*** I/O DICOST PROGRAM ***				
1452			*** DETERMINE WHICH STATUS INDICATORS ARE ON ***				
1453			THIS ROUTINE DETERMINES WHICH STATUS INDICATORS ARE ON,ON THE				
1454			CHANNEL BEING USED.THE INDICATORS FOUND ON ARE STORED IN THE				
1455			PRINT FIELD AND THE PROGRAM BRANCHES TO ERROR CONTROL.				
1456	STACHK	SBR	X5	STORE ADDR IN IND 5	7	03333	G 00049 B
1457		SBR	X2		7	03340	G 00034 B
1458		BW	0&X2,LPRT		12	03347	V 000.0 02799 1
1459		S	@7@,X5	REDUCE ADDR BY 7	11	03359	S 10626 00049
1460		MLCS	0&X5,LCOP&10		12	03370	D 00**0 01023 3
1461		MRCWG	STIND,237	MOVE STATUS CODES	12	03382	D 02850 00237 DL
1462	CPT2	MLCA	ADDR03,X1	LOAD IND REG 1	12	03394	D 02810 00029 T
1463		MLCS	0&X5,NUOPCO	STORE CHNL CODE	12	03406	D 00**0 03436 3
1464		B	CHALTR		7	03418	J 01045
1465		DCW	CNTERR	HIGH LIMIT	5	03429	03591
1466		DC	NOTRDY	LOW LIMIT	5	03434	03449
1467		DCW	@ @		1	03435	
1468	NUOPCO	DC	@ @		1	03436	
1469		DC	@ @		1	03437	
1470		ZA	@0C237@,X5	LOAD IX 5	11	03438	QM 10631 00049
1471	NOTRDY	NOP			1	03449	N
1472		BNR1	CNTERR	CHECK FOR NOT READY	7	03450	R 03591 1
1473		B	UPIX	GO UPDATE IND REG	7	03457	J 03633
1474	BUSY	NOP			1	03464	N
1475		BCB1	CNTERR	CHECK FOR BUSY	7	03465	R 03591 2
1476		B	UPIX	GO UPDATE IND REG	7	03472	J 03633
1477	CATACK	NOP			1	03479	N
1478		BER1	CNTERR	CHECK DATA CNK	7	03480	R 03591 4
1479		B	UPIX	GO UPDATE IND REG	7	03487	J 03633
1480	EXTCND	NOP			1	03494	N
1481		BEF1	CNTERR	CHECK FOR EXT COND	7	03495	R 03591 8
1482		B	UPIX	GO UPDATE IND REG	7	03502	J 03633
1483	NOTRNS	NOP			1	03509	N
1484		BNT1	CNTERR	CHECK FOR NO TRANS	7	03510	R 03591 SB
1485		B	UPIX	GO UPDATE IND REG	7	03517	J 03633
1486	WLR	NOP			1	03524	N
1487		BWL1	CNTERR	CHECK FOR WLR	7	03527	R 03 -

ERROR CONTROL-CHECK STATUS INDICATORS

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1488		B	UPIX	GO UPDATE IND REG	7	03532	J 03633
1489		SW	NOTRDY&1,BUSY&1	RESET INSTRUCTIONS	11	03539	, 03450 03465
1490		SW	DATACK&1,EXTCND&1		11	03550	, 03480 03495
1491		SW	NOTRNS&1,WLR&1		11	03561	, 03510 03525
1492		PROG	237,SAVIND	SAVE IND	12	03572	D 00237 02838 $
1493		B	ERRCTL	RETURN	7	03584	J 02876
1494	CNTERR	SBR	X6	STORE RETURN ADDR	7	03591	G 00054 B
1495		OPT2 A	@18,0&X1	UPDATE STATUS COUNT	11	03598	A 10619 000#0
1496		A	@78,X6	UPDATE RETURN ADDR	11	03609	A 10626 00054
1497		CW	ERROSW&1	TURN OFF ERROR SW	6	03620	¤ 03183
1498		B	UPIX&19		7	03626	J 03652
1499	UPIX	SBR	X6	STORE RETURN ADDR	7	03633	G 00054 B
1500		MLCS	@ @,0&X5	REMOVE STATUS CHAR	12	03640	D 10618 00##0 3
1501		OPT2 A	@2@,X1	UPDATE IND REG 1	11	03652	A 10632 00029
1502		A	@2@,X5	UPDATE IND REG 5	11	03663	A 10632 00049
1503		B	0&X6	RETURN TO PROGRAM	7	03674	J 00#.0
1504							

```
PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1506          CPT1*** ALTER ROUTINE SEQUENCE ***
1507          CPT1    *** I/O DICOST PROGRAM ***
1508        IF THE ALTER ROUTINE SEQUENCE OPTION HAS BEEN SELECTED,MONITOR
1509       WILL BRANCH TO THIS ROUTINE.THE LIST OF ROUTINE NUMBERS ENTERED
1510       BY THE CE IS EXAMINED AND THE ROUTINES ARE MADE TO RUN IN THE
1511       SEQUENCE SELECTED.WHEN ALL ROUTINES SELECTED HAVE BEEN RUN THE
1512       PROCESS IS REPEATED OR THE ROUTINE GOES TO PROGRAM CONTROL.THIS
1513       IS DETERMINED BY THE LAST CHARACTER ENTERED WHEN THIS OPTION WAS
1514       SELECTED.IF IT IS L THE PROCESS IS REPEATED,IF IT IS E THE PRO-
1515       CESS ENDS AFTER ONE PASS.
1516
1517   SEQCTLCPT1 BCE    PRGCTL,0&X4,E      END OF SEQ CONTROL               12  03681  B 02285 00*00 E
1518         CPT1 BCE    *&8,0&X4,L         SHOULD SEQ BE REPEAT             12  03693  B 03712 00*00 L
1519         CPT1 B      *&13                                                 7  03705  J 03724
1520         CPT1 MLNA   SQCCN1,X4          RESET IX4 TO REPEAT              12  03712  D 02773 00044 /
1521         CPT1 MLNS   1&X4,CMPFLC-1      MOVE ROUTINE #                   12  03724  D 00*01 02776 1
1522         CPT1 MLNS                      MOVE ROUTINE #                    1  03736  D
1523         CPT1 A      @3@,X4             UPDATE X4                        11  03737  A 10625 00044
1524         CPT1 MLNA   @099995@,X1        LOAD IX 1                        12  03748  D 10637 00029 /
1525   LOCWM CPT1 SCNLA  0&X1,0&X1          LOOK FOR WM                      12  03760  D 000*0 000*0 S B
1526         CPT1 SAR    X1                 STORE ADDR OF OPER                7  03772  G 00029 A
1527         CPT1 BCE    *&8,1&X1,N         IS OP CODE N                     12  03779  B 03798 000*1 N
1528         CPT1 B      LOCWM              GO FIND NEXT OPER                 7  03791  J 03760
1529         CPT1 C      3&X1,CMPFLC-1      IS THIS THE ROUT                 11  03798  C 000*3 02776
1530         CPT1 BE     *&8                IF IT IS BRCH                     7  03809  J 03823 S
1531         CPT1 B      LOCWM              GO FIND NEXT OPER                 7  03816  J 03760
1532         CPT1 BW     *&8,4&X1           BRCH IF THIS IS ROUT             12  03823  V 03842 000*4 1
1533         CPT1 B      LOCWM                                                7  03835  J 03760
1534         CPT1 ZA     X1,X3              LOAD IX 3                        11  03842  M 00029 00039
1535         CPT1 A      @1@,X3             ADJUST ADDR                      11  03853  A 10619 00039
1536         CPT1 B      0&X3               GO TO ROUTINE SELECTED            7  03864  J 000M0
1537
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```
PGLIN     LABBU      OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1539                    *** I/O DICOST PROGRAM ***
1540                 ***       SUMMARY RCUTINE       ***
1541           AFTER A COMPLETE PASS OF THE PROGRAM OR IF THE PROGRAM IS TERM-
1542         INATED THIS ROUTINE ORGANIZES A SUMMARY OF PROGRAM DETECTED
1543         ERRORS AND STATUS ERRORS.IT CAUSES THIS SUMMARY TO BE TYPED AND
1544         BRANCHES TO THE END OF TEST ROUTINES.THIS ROUTINE IS ALSO USED TO
1545         TYPE OUT THE ERROR COUNT IC MESSAGE WHEN A PROGRAM DETECTED ERROR
1546         OCCURES FOR THE TENTH TIME.
1547
1548      SUMIT CPT2 B       TYP1                 GO TYPE ERROR MESG     7  03871  J 01593
1549            CPT2 DCW     @ERR CNT@,G                                 7  03884
1550            CPT2 MLNWA   @01@,CNTMSG-4        LOAD ERR INTO MESG    12  03886  D 10639 03947 V
1551            CPT2 ZA      @0CC01@,X7           LOAD IX 7             11  03898  M 10644 00059
1552      MOVCNTOPT1 MLNS    STPTAB&X7,CNTMSG     MOVE ERROR COUNT      12  03909  O 01YM1 03951 1
1553            CPT2 C       CNTMSG,@1@           CHECK FOR ERROR       11  03921  C 03951 10619
1554            CPT1 BH      *&15                 ZERO COUNT             7  03932  J 03953 U
1555            OPT2 B       TYP1                 GO TYPE ERROR MESG     7  03939  J 01593
1556      CNTMSGCPT2 DCW     @      @,G                                   6  03951
1557            CPT2 A       @1@,CNTMSG-4         UPDATE ERROR NUMBER   11  03953  A 10619 03947
1558            CPT2 A       @1@,X7               UPOATE IX 7           11  03964  A 10619 00059
1559            CPT2 C       CNTMSG-4,@51@        HAVE ALL ERRORS BEEN  11  03975  C 03947 10646
1560            CPT2 BE      *&8                     INOICATEO           7  03986  J 04000 S
1561            OPT2 B       MOVCNT                                      7  03993  J 03909
1562            CPT2 ZA      @0C000@,X7           LOAO IX 7             11  04000  M 10651 00059
1563      MOVSTCOPT2 MLCA    STACOO&X7,CTMSG2-3   MOVE STATUS COOE      12  04011  D 02YF3 04043 T
1564            OPT2 MLNA    STACNT&X7,CTMSG2     MOVE STATUS ERROR CT  12  04023  O 02WE7 04046 /
1565            CPT2 B       TYP1                                        7  04035  J 01593
1566      CTMSG2CPT2 DCW     @      @,G                                   5  04046
1567            CPT2 A       @2@,X7                                     11  04048  A 10632 00059
1568            OPT2 BCE     ENDTST&12,CTMSG2-4,W HAVE ALL CODES BEN    12  04059  B 09300 04042 W
1569            CPT2 B       MOVSTC                  CHKO               7  04071  J 04011
1570      SUMARYCPT2 MLNA    X1,MAXMSG-7          MOVE ERROR NUMBER     12  04078  D 00029 04107 /
1571            CPT2 CW      X1-1                 RESET IX REG           6  04090  ¤ 00028
1572            CPT2 B       TYP1                 GO TYPE MESSAGE        7  04096  J 01593
1573      MAXMSGCPT2 DCW     @ERR00 CNT 1C@,G                           12  04114
1574      SUMXITCPT2 B       AFTSRH                                      7  04116  J 03170
1575      CTLFLD     EQU     201
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1576		PST				

INITIALIZE FOR DCO2

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1578	START	SW	CHNLSW&1	TURN ON CHANNEL SW	6	04123	, 07853
1579		MLCA	@OC@,FILE&1	SET ACC & MOD ADDR	12	04129	D 10653 10992 T
1580		MRCWG	INTRET,108	LOAD INTERUPT INST	12	04141	D 10589 00108 D L
1581		SW	FILE&1		6	04153	, 10992
1582		S	DELAY	RESET DELAY	6	04159	S 10550
1583		S	OVLCNT	RESET OVLAP COUNTER	6	04165	S 10545
1584		S	TOTIME	RESET TOTAL TIME CNT	6	04171	S 10320
1585		S	SEGFLD-1		6	04177	S 02667
1586		S		RESET ERROR COUNTERS	1	04183	S
1587		S			1	04184	S
1588		S			1	04185	S
1589		S			1	04186	S
1590		S			1	04187	S
1591		B	TYP1	GO TYPE BLANKS	7	04188	J 01593
1592		DCW	@ @,G		4	04198	
1593	TIMEIT	WCP	BLANK	TYPE BLANKS	10	04200	M %TO 10584 W G
1594		BA1	*&1		7	04210	R 04217 M
1595		BCB1	*&8	CONSOLE STILL BUSY	7	04217	R 04231 2
1596		B	GETSET		7	04224	J 04249
1597		A	@317@,TOTIME	KEEP TOTAL TIME	11	04231	A 10656 10320
1598		B	TIMEIT		7	04242	J 04200
1599	GETSET	ZA	@01332@,X1C	LOAD IX 10	11	04249	M 10661 00074 Q
16C0		ZA	@OC000@,X15	LOAD IX 15	11	04260	M 10651 00099 Q
16C1		ZA	&N18,X3	LOAD IX3	11	04271	M 10666 00039 Q
16C2		B	N18&10		7	04282	J 07534
16C3							

```
PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1605                      *** TEST ROUTINE DESCRIPTION ***
1606                           *** TEST NOT READY ***
1607
1608          THIS TESTS THE ABILITY OF THE 7631-1302 TO GIVE A NOT READY
1609        INDICATION WHEN AN INOPERATIVE ACCESS IS ADDRESSED.EVERY MODULE
1610        AND ACCESS ARE ADDRESSED UNTIL ONE INDICATES NOT READY.IF NONE
1611        GIVE A NOT READY IT IS CONSIDERED AN ERROR. NOTE IF MODULES 0-9
1612        ARE AVAILABLE ON ONE CHANNEL, THE ACCESS ON ONE OF THE MODULES
1613        MUST BE SET INOPERATIVE BEFORE RUNNING THIS PROGRAM.
1614
1615                      ONLY THE SEEK OPERATION IS USED IN THIS ROUTINE
1616
1617
1618      NO1         NOP                                                    1  04289  N
1619                  DC      @01@              ROUTINE ID                   2  04291
1620      BOTTOM      MLCA    @CCCC@,FILE&5     LOAD FILE ADDRS             12  04292  D 10670 10996 T
1621      TSTRDY      SD      1,FILE            TRY A MOD                   10  04304  M %F0 10991 R
1622                  BA1     *&1                                           7  04314  R 04321 M
1623                  BNR1    NOTRDE            BRCH NOT READY               7  04321  R 04393 1
1624                  A       @1@,FILE          UPDATE A                    11  04328  A 10619 10991
1625                  BCE     TSTRDY,FILE,1     BRCH NO ACCESS OVERFLOW     12  04339  B 04304 10991 1
1626                  S       @2@,FILE          RESET ACCESS                11  04351  S 10632 10991
1627                  A       @1@,FILE&1        ADD 1 TO MOD ADDR           11  04362  A 10619 10992
1628                  BZ      *&8               BRCH ON TENTH MOD            7  04373  J 04387 V
1629                  B       TSTRDY                                         7  04380  J 04304
1630                  SW      E2                NO ACCESS OR MODULE WAS FOUND 6  04387  , 01803
1631        NOT READY, ERROR 2 IS INDICATED BECAUSE OF THIS. INSURE THAT ONE
1632        ACCESS IS INOPERATIVE OR SOME MODULE 0-9 IS OFF LINE.
1633      NOTRDE      MLNS    RDYMSG&14,FILE&1  MOVE MOD ADDR               12  04393  D 07791 10992 1
1634                  MLNS    RDYMSG&8,FILE                                 12  04405  D 07785 10991 1
1635      NO1XIT      B       MONITR                                         7  04417  J 02101
1636
```

TEST BUSY

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1638			*** TEST ROUTINE DESCRIPTION ***				
1639			*** TEST ACCESS BUSY ***				
1640			TWO SUCCESSIVE SEEK OPERATIONS ARE ISSUED TO THE ACCESS BEING				
1641			TESTED.AFTER THE 2ND SEEK THE BUSY INDICATOR IS CHECKED.IF BUSY				
1642			IS NOT ON ERROR 4 IS INDICATED.A READ HAD OPERATION FOLLOWING THE				
1643			TWO SEEKS VERIFIES THAT THE ACCESS ARRIVED AT THE CORRECT LOCA-				
1644			TION.ALL COMMON STATUS ERRORS ARE ALSO CHECKED IN THIS ROUTINE.				
1645			THE TRACK-HEAD ADDRESS USED IS 9#20 HA1 .				
1646							
1647							
1648	NO2	NOP			1	04424	N
1649		DC	&02@	ROUTINE IT	2	04426	
1650		MLCA	&9#20@,FILE&5	RESET ADDRESS	12	04427	D 10674 10996 T
1651		SD	1,FILE	SEEK ACCESS	10	04439	M %F0 10991 R
1652		BCB1	*-16		7	04449	R 04439 2 G
1653		BA1	*&1		7	04456	R 04463 M
1654		SC	1,FILE	SEEK ACCESS	10	04463	M %F0 10991 R G
1655		BA1	*&1		7	04473	R 04480 M
1656		BCB1	*&7	BRCH BUSY	7	04480	R 04493 2
1657			*** SET ERROR 4 ON ***				
1658		SW	E4	SET ERROR IND	6	04487	. 01805
1659		THIS ERROR IS SET WHEN BUSY IS NOT TURNED ON BY 2 SUCCESSIVE SKS					
1660		MU	%F5,FILE,R	READ & VERIFY ACC	10	04493	M %F5 10991 R
1661		BCB1	*-16	ARRIVAL	7	04503	R 04493 2 G
1662		BA1	*&1		7	04510	R 04517 M
1663		BEX1	STACHK,Y	BRCH ON COND OR NO T	7	04517	R 03333 Y
1664		IF THE ACCESS DID NOT ARRIVE AT THE CORRECT LOCATION THE NO REC-					
1665		ORD FOUND WILL CAUSE THE NC TRANSFER AND EXTERNAL CONDITION					
1666		STATUS INDICATORS TO COME ON.					
1667	NO2XIT	B	MONITR		7	04524	J 02101
1668							

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1670                    *** TEST RCUTINE DESCRIPTION ***
1671              *** TEST DATA CHECK & EXT CONDITION WHEN CAUSED BY ***
1672                   *** FORMAT CHARACTER CHECK & GAP DETECTORS ***
1673             A FORMAT IS WRITTEN WITH CNE ILLEGAL CHAR,BLANK,IN THE DATA
1674            FIELD,AND THE DATA CHECK INDICATOR IS TESTED.IF THERE IS NO DATA
1675            CHECK,ERROR 5 IS INDICATED.THE DATA FIELD IS RESTORED AND A PRO-
1676            PER FORMAT IS WRITTEN,BEFORE WRITE CHECKING THE FORMAT THE DATA
1677            FIELD GAP BEFORE HA2 AREA IS INCREASED BY CNE,THE WRITE DISK CHK
1678            SHOULD CAUSE A 7631 CKT CHECK  EXT COND ,IF IT DOESN T ERROR 6 IS
1679            INDICATED.THE GAP THAT WAS INCREASED IS REMOVED COMPLETELY AND A
1680            WRITE CHECK IS ISSUED.IF THERE IS NO RESULTING EXT COND,ERROR 7
1681            IS INDICATED.THE DATA FIELD IS RESTORED AND A WRITE CHECK INSURES
1682            THAT THE FORMAT IS CORRECT,A DATA CHECK AT THIS TIME CAUSES ERROR
1683            8 TO BE INDICATED.
1684
1685            THE DATA FIELDS USED ARE AS FOLLOWS   ALL SIX BIT MODE
1686
1687            WRITE FORMAT WITH ILLEGAL CHAR AS THE 40TH CHAR
1688            444444333333333333433333333333334 6 BIT MODE HA2 OF 201 CHARS
1689            WRITE PROPER FORMAT & LAST WRITE CHECK FORMAT
1690            444444333333333333433333333333334111111111222222222222222211111111
1691            111112111111111111121111111111111112
1692            WRITE CHECK FORMAT WITH GAP LENGTH INCREASED
1693            444444333333333333433333333333333344 REMAINDER UNCHANGED
1694            WRITE CHECK FORMAT WITH GAP REMOVED
1695            444444333333333333433333333333333311 REMAINDER UNCHANGED
1696
1697    N03     NCP                                                 1  04531  N
1698            DC      @03@            ROUTINE ID                  2  04533
1699            CS      DATAFD&299                                  6  04534  / 11299
1700            CS                                                  1  04540  /
1701            CS                                                  1  04541  /
1702            MLCS    @1@,DATAFD      LOAD                       12  04542  D 10619 11000 3
1703            SW      DATAFD&224          6 BIT                   6  04554  , 11224
1704            MRC     DATAFD,DATAFD&1         FORMAT             12  04560  D 11000 11001 #
1705            MRCWG   GAP6,DATAFD&224             INTO           12  04572  D 10396 11224 L
1706            MLCA    HAAREA,DATAFD&32 THE DATA FIELD            12  04584  D 10357 11037 *
```

```
PGLIN   LABEL    OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1707             MLCS   @ @,DATAFD&40      SET ILLEGAL FORMAT   12  04596  D 10618 11040 3
1708             MU     %F7,FILE,W         WRITE FORMAT         10  04608  M %F7 10991 W
1709             BCBI   *-16                                      7  04618  R 04608 2
1710             BAI    *&1                                       7  04625  R 04632 4
1711             BER1   FORCHK             BRCH ON DATA CHECK    7  04632  R 04645 4
1712                 *** SET ERROR 5 ON ***
1713             SW     E5                                        6  04639  , 01806
1714       ILLEGAL FORMAT CHAR DION T CAUSE DATA CHECK
1715   FORCHK    MLCS   @1@,DATAFD&40      RESTORE BAD CHAR     12  04645  D 10619 11040 3
1716             MLCA   GAP6,DATAFC&84     PREPARE FIELD FOR A  12  04657  D 10396 11084 T
1717             MRCHG  GAP6,DATAFC&102      A SHORT FORMAT     12  04669  D 10396 11102 L
1718             MU     %F7,FILE,W         WRITE FORMAT         10  04681  M %F7 10991 W
1719             BAI    STACHK             BRCH ON ANY ERROR     7  04691  R 03333 M
1720             MLCS   @4@,DATAFC&33      INCREASE GAP LENGTH  12  04698  D 10675 11033 3
1721             WCC    1,FILE             WRITE DISK CHK WITH  10  04710  M %F3 10991 W
1722             BAI    *&1                 LONG GAP             7  04720  R 04727 M
1723             BEF1   GAPCK              BRCH ON EXT COND      7  04727  R 04740 8
1724                 *** SET ERROR 6 ON ***
1725             SW     E6                 TURN ON ERROR IND     6  04734  , 01807
1726       LONG GAP DION T CAUSE EXT. CONDITION
1727   GAPCK     MLCA   @3I@,DATAFC&33     REMOVE GAP COMPLETELY 12  04740  D 10677 11033 T
1728             WCC    1,FILE             WCC WITH A GAP       10  04752  M %F3 10991 W
1729             BAI    *&1                   MISSING           7  04762  R 04769 M
1730             BEF1   TSTWFO              BRCH ON EXT COND      7  04769  R 04782 9
1731                 *** SET ERROR 7 ON ***
1732             SW     E7                 TURN ON ERROR IND     6  04776  , 01808
1733       MISSING GAP DICN T CAUSE EXT. CONDITION
1734   TSTWFO    MLCS   @4@,DATAFC&32      RESTORE GAP          12  04782  D 10675 11032 3
1735             WCC    1,FILE             WCC FORMAT           10  04794  M %F3 10991 W
1736             BER1   NO3XIT-6           BRCH ON DATA CHK      7  04804  R 04825 4
1737             BAI    STACHK             BRCH ON ANY ERROR     7  04811  R 03333 M
1738             B      NO3XIT                                   7  04818  J 04831
1739                 *** SET ERROR 8 ON ***
1740             SW     E8                 SET ERROR IND         6  04825  , 01809
1741       PROPERLY WRITTEN FORMAT.CAUSES DATA CHECK WHEN WRITE CHECKED
1742   NO3XIT    B      MONITR                                   7  04831  J 02101
1743
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1745                       ***TEST ROUTINE DESCRIPTION ***
1746              ***TEST DATA CHECK CAUSED BY PARITY,CHAR CODE CHK ***
1747                          *** WRITE DISK CHECK ***
1748            A RECORD IS WRITTEN IN 6 BIT MODE USING THE HAO OP,THIS IS
1749           IS FOLLOWD BY A READ HAO OPERATION,8 BIT MODE,CAUSING PARITY OR
1750           CHAR CODE CHECK IN THE 7631.THE DATA CHECK INDICATOR IS TESTED
1751           ANC IF IT IS NCT ON-ERROR 9 IS INDICATED.
1752           THE RECORD IS REWRITTEN IN THE SIX BIT MODE BUT
1753           BBFORE IT IS WRITE CHECKED THE DATA FIELD IN MEMORY IS ALTERED.
1754           THE RECORD IS WRITE CHECKEC USING THE ALTERED DATA FIELD AND THE
1755           DATA CHECK IND IS TESTED IF IT ISN T ON ERROR 11 IS INDICATED.
1756
1757           FORMAT REQUIRED IS IN SIX BIT MODE ON CYLINDER 250
1758           444444333333333333433333333333341111111112222222222222211111111
1759           111112111111111111121111111111111112
1760
1761           DATA FIELD ORGANIZATION
1762           HA2 2 CHAR-REC ADDR 6 CHAR-RECORD 10 CHAR
1763
1764           DATA FIELD USEC
1765           88ACCRC1###---CCC
1766
1767      A04          NCP                                                   1  04838  N
1768                   DC       &04&              ROUTINE ID                 2  04840
1769                   CS       DATAFD&299                                   6  04841  / 11299
1770                   CS                              DATA                  1  04847  /
1771                   CS                                 FIELD              1  04848  /
1772                   MRCWG    HACP,DATAFD       LOAD THE                   12  04849  D 10398 11000 L
1773                   MLCWS    &MG,DATAFD&1      SET TERMINATING WMGM       12  04861  D 10617 11001 7
1774                   MU       %F5,FILE,W        WRITE A RECORD             10  04873  M %F5 10991 W
1775                   BA1      *&1                                           7  04883  R 04890 M
1776                   LU       %F5,FILE,R        READ RECORD IN             10  04890  L %F5 10991 R
1777                   BA1      *&1                  WRONG MODE              7  04900  R 04907 M
1778                   BER1     REWRT             BRCH ON DATA CHECK         7  04907  R 04920 4
1779                       *** SET ERROR 9 ON ***
1780                   SW       E9                SET ERROR IND              6  04914  . 01810
1781           8 BIT MODE READ OF 6 BIT MODE DATA DOESN T CAUSE DATA CHECK
```

TEST DATA CHECK DC02 PAGE 102

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1782      REWRT     MRCWG  MACP,DATAFD                      12  04920  D 10398 11000 DL
1783                MLCWS  &MG,DATAFD&18                     12  04932  D 10617 11018 7
1784                MU     &F5,FILE,W                       10  04944  M &F5 10991 W
1785                BAL    STACHK                           7   04954  R 03333 MG
1786                MLCA   @ &,DATAFD&8                     12  04961  D 10618 11008 T
1787                WOC    1,FILE                           10  04973  M &F3 10991 W
1788                BAL    *&1                              7   04983  R 04990 MG
1789                BERI   NO4XIT                           7   04990  R 05003 4
1790                    *** SET ERRCR 11 ON ***
1791                SW     E11                              6   04997  , 01812
1792      &RITE CHECK WITH ALTERED DATA FIELD DOESN T CAUSE DATA CHECK
1793      NO4XIT    B      MONITR                           7   05003  J 02101
1794
```

```
PGLIN   LABEL   OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1796                *** TEST ROUTINE DESCRIPTION ***
1797            ***TEST EXT CONDITION AND NO TRANSFER CAUSED BY ***
1798              *** INVALID ADDRESS,NO RECORD FOUND & IMPROPER MODE SETTING
1799          A SEEK OP WITH INVALID ADDR 9@80 IS ISSUED,THIS IS FOLLOWED
1800         BY A READ HAD OP.SINCE THE INVALID ADDR SHOULD HAVE CAUSED THE
1801         ACCESS TO REZERO,THE DATA CHECK IND SHOULD BE TURNED ON.IF THE
1802         INDICATOR IS NOT ON ERROR 12 IS INDICATED.THE ACCESS IS RE-POSI-
1803         TIONED TO CYL 253  9#20  AND A READ OP WITH ADDR 9#00 IS ISSUED.
1804         THE NO RECORD FOUND SHOULD TURN ON EXT COND AND NO TRANSFER.IF
1805         EITHER OR BOTH THE INDICATORS DO NOT COME ON ERRORS 13&14 RESP-
1806         ECTFULLY ARE INDICATED.ANOTHER SEEK IS ISSUED FOLLOWED BY A WRITE
1807         DISK CHECK,THIS SHOULD CAUSE IMPROPER MODE SETTING RESULTING IN
1808         AN EXT CONDITION.IF IT DOESN T ERROR 15 IS INDICATED.
1809
1810    NO5          NOP                                          1  05010  N
1811                 DC     @05@                 ROUTINE ID       2  05012
1812                 BCE    *&&,SPTAD0,1         CHECK FOR MANUAL MODE  12  05013  B 05032 01004 1
1813                 B      RESEEK               BRCH             7  05025  J 05185
1814                 B      TYP1                                  7  05032  J 01593
1815                 DCW    @TURN OFF CE-WRT SW@,G               18  05056
1816                 H                                            1  05058  .
1817                 MLCA   @9&80@,FILE&5        SET TKHD ILLEGAL  12  05059  D 10681 10996 T
1818                 SD     1,FILE               TRY A SEEK       10  05071  M %F0 10991 R
1819                 BCB1   *-16                                  7  05081  R 05071 2
1820                 BA1    *&1                                   7  05088  R 05095 G M
1821                 MLCA   @CC00@,FILE&5        RESET TRACK & HEAD  12  05095  D 10670 10996 T
1822                 MU     %F5,FILE,R                           10  05107  M %F5 10991 R
1823                 BCB1   *-16                                  7  05117  R 05107 2
1824                 BA1    *&1                                   7  05124  R 05131 G M
1825                 BNT1   *&8                  CHEK FOR NO RECORD FOUND  7  05131  R 05145 S B
1826                 B      *&8                                   7  05138  J 05152
1827                 BER1   *&7                  CHEK FOR REZERO   7  05145  R 05158 4
1828                    *** SET ERROR 12 ON @@@
1829                 SW     E12                  SET ERROR IND     6  05152  . 01813
1830          INVALID ADDRESS DOESN T RESULT IN DATA CHECK
1831                 B      TYP1                                  7  05158  J 01593
1832                 DCW    @TURN ON CE-WRT SW @,G               18  05182
```

```
                    TEST EXTERNAL COND & NO TRANS
PGLIN     LABEL     OPCOD  OPERAND
1833                H
1834      RESEEK    MLCA   @00002@,FILE&5      INSURE FILE ADDR IS RESET
1835                SD     1,FILE              POSITION ACCESS
1836                BCB1   *-16
1837                BA1    *&1
1838                MLCA   @9930@,FILE&5       RESET TRACK & HEAD
1839                SD     1,FILE              POSITION ACCESS
1840                BCB1   *-16
1841                BA1    *&1
1842                MLCA   @9#20@,FILE&5       RESET ADDRESS
1843                MU     %F5,FILE,R          READ USING INCOR
1844                BCB1   *-16                   RECT TKHD ADDR
1845                BA1    *&1
1846                BEF1   *&7                 BRCH ON EXT COND
1847                    *** SET ERROR 13 ON ***
1848                SW     E13                 SET ERROR IND
1849      NO RECORD FOUND NOT SETTING EXT CONDITION
1850                BNT1   *&7                 BRCH ON NO TRANS.
1851                    *** SET ERROR 14 ON ***
1852                SW     E14                 SET ERROR IND
1853      NO RECORD FOUND NOT SETTING NO TRANSFER
1854                SD     1,FILE              POSITION ACCESS
1855                BA1    *&1
1856                WCC    1,FILE              WRT DISK CHK WITH
1857                BCB1   *-16                  IMPROPER MODE SET
1858                BA1    *&1
1859                BEF1   NOSXIT              BRCH ON EXT COND
1860                    *** SET ERROR 15 ON ***
1861                SW     E15                 SET ERROR IND
1862      IMPROPER MODE SETTING DOESN T CAUSE EXT CONDITION
1863     NOSXIT     B      MONITR
1864
```

```
CT  ADDRS  INSTRUCTION
 1  05184  .
12  05185  D 10670 10996 T
10  05197  M %F0 10991 R
 7  05207  R 05197 2
 7  05214  R 05221 G M
12  05221  D 10685 10996 T
10  05233  M %F0 10991 R
 7  05243  R 05233 2
 7  05250  R 05257 G M
12  05257  D 10674 10996 T
10  05269  M %F5 10991 R
 7  05279  R 05269 2
 7  05286  R 05293 G M
 7  05293  R 05306 8
 6  05300  , 01814
 7  05306  R 05319 S B
 6  05313  , 01815
10  05319  M %F0 10991 R
 7  05329  R 05336 G M
10  05336  M %F3 10991 W
 7  05346  R 05336 2
 7  05353  R 05360 G M
 7  05360  R 05373 8
 6  05367  , 01816
 7  05373  J 02101
```

```
PGLIN   LABEL    OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1866                    *** TEST ROUTINE DESCRIPTION ***
1867                  *** TEST WRONG LENGTH RECORD LONG AND SHORT ***
1868          A READ HAD WITH A DATA FIELD OF ONE CHARACTER IS ISSUED.THE
1869         WRONG LENGTH RECORD IND. IS CHECKED IF IT IS NOT ON ERROR 16 IS
1870         INDICATED.A READ HAD WITH A DATA FIELD THAT HAS NO TERMINATING
1871         WORD MARK GROUP MARK IS ISSUED, THE WLR INDICATOR IS CHECKED AND
1872         IF IT IS NOT ON ERROR 17 IS INDICATED.
1873
1874         FORMAT REQUIRED IS IN SIX BIT MODE ON CYLINGER 253
1875         444444333333333333433333333333341111111111 REC ADDR & REC
1876         DATA FIELD USED FOR SHORT RECORD 8
1877
1878         DATA FIELD USED FOR LONG RECORD,FROM START OF DATA FIELD TO THE
1879         END OF MEMORY
1880      NO6        NOP                                1  05380  N
1881                 DC     @06@                ROUTINE ID  2  05382
1882                 MLCWS  @M@,DATAFD&1                   12  05383  D 10617 11001 7
1883                 MU     %F5,FILE,R          READ WITH W.L.R.  10  05395  M %F5 10991 R
1884                 BCBI   *-16                    RECORD SHORT  7  05405  R 05395 2
1885                 BA1    *&1                                   7  05412  R 05419 M
1886                 BWL1   *&7                 BRCH ON W.L.R.  7  05419  R 05432 -
1887                     *** SET ERROR 16 ON ***
1888                 SW     E16                 SET ERROR IND.  6  05426  , 01817
1889         SHORT DATA FIELD DOESN T CAUSE WRONG LENGTH RECORD
1890                 CS     DATAFD&299          CLEAR           6  05432  / 11299
1891                 CS                              DATA       1  05438  /
1892                 CS                                  FIELD  1  05439  /
1893                 MU     %F5,FILE,$          READ TO END OF MEM  10  05440  M %F5 10991 $
1894                 BA1    *&1                    RECORD LONG  7  05450  R 05457 M
1895                 BWL1   *&7                 BRCH ON W.L.R.  7  05457  R 05470 -
1896                     *** SET ERROR 17 ON ***
1897                 SW     E17                 SET ERROR IND.  6  05464  , 01818
1898         LONG DATA FIELD DOESN T CAUSE WRONG LENGTH RECORD
1899      NO6XIT     B      MONITR                         7  05470  J 02101
1900
```

```
PGLIN     LABEL     OPCOD  OPERAND                  CT  ADDRS  INSTRUCTION
1902                    *** TEST ROUTINE DESCRIPTION ***
1903                      *** RANDOM SEEK TEST ***
1904          USING A FOUR DIGIT NUMBER,DEVELOPED FROM THE TIME TAKEN FOR THE
1905        CARRIAGE ON THE TYPEWRITER TO RETURN,RANDOM ADDRESSES ARE GENER-
1906        ATED FOR THE FILE.A SEEK IS ISSUED FOR EACH ADDRESS AND ARRIVAL
1907        OF THE ACCESS IS VERIFIED BY A READ HAD OP.IF THE READ OP RESULTS
1908        IN A NO RECORD FOUND,ERROR 1 IS INDICATED FOLLOWED BY THE FILE
1909        ADDRESS BEING USED.ANY STATUS INDICATORS ENCOUNTERED BY THE SEEK
1910        OR READ OPS WILL ALSO BE INDICATED.IF THE PROGRAM IS IN THE MAN-
1911        UAL MODE,A NO RECORED FOUND ON THE READ OP WILL CAUSE A REQUEST T
1912        TURN ON THE CE-HAD SO THAT THE ADDRESS AT WHICH THE ACCESS
1913        ACTUALLY ARRIVED AT CAN BE DISPLAYED FOR ANALYSIS.100 SEEKS ARE
1914        MADE IN THE ROUTINE,AFTER WHICH THE ACCESS IS POSITIONED AT THE
1915        DIAGNOSTIC CYL 250.IF BOTH ACCESSES ON A MODULE ARE READY THEY
1916        WILL BOTH BE USED IN THIS ROUTINE.
1917
1918      NO7       NOP                                          1  05477  N
1919                DC        @07@          ROUTINE ID           2  05479
1920                SW        FILE&2                             6  05480  , 10993
1921                MLNWA     TOTIME,FILE&5 MOVE IN RANDOM ADDR 12  05486  D 10320 10996 V
1922      SEEKS     SO        1,FILE        MOVE THE ACCESS     10  05498  M %F0 10991 R  SEEK
1923                BCB1      *-16                               7  05508  R 05498 2
1924                BAL       *&1                                7  05515  R 05522 G M
1925                BNR1      RANDOM                             7  05522  R 05560 1
1926                MU        %F5,FILE,R    VERIFY ACCESS ARRIVL10  05529  M %F5 10991 R  - HAD READ
1927                BCB1      *-16                               7  05539  R 05529 2
1928                BEX1      VERROR,Y      BRCH ON COND ON NOT  7  05546  R 05641 Y
1929                BAL       *&1                                7  05553  R 05560 G M
1930      RANDOM    A         @300@,TOTIME  INCREASE VARIABLE BY 11  05560  A 10688 10320
1931                A         TOTIME,FILE&5   300 AND ADD TO ADR 11  05571  A 10320 10996
1932                A         @1@,FILE      UPDATE ACCESS ADDRESS11  05582  A 10619 10991
1933                BCE       SEEKS,FILE,1  BRCH IF NO ACCESS OVERFLOW12 05593  B 05498 10991 1
1934                S         @2@,FILE      RESET ACCESS        11  05605  S 10632 10991
1935                A         @1@,COUNT     ADD 1 TO PASS COUNT 11  05616  A 10619 10552
1936                BZ        ENDSKS        BRCH ON 101 PASS     7  05627  J 05792 V
1937                B         SEEKS                              7  05634  J 05498
1938                    *** SET ERROR 1 ON ***
```

```
PGLIN    LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1939     VERROR   SW     E1,EXTRA&1          SET ERROR            11  05641  . 01802 03252
1940       ON A RANDOM SEEK ACCESS POSITION RESULTED IN A NO RECORD FOUND
1941              MRCWG  FILE,DATA           MOVE FAILING ADDR    12  05652  D 10991 01710 D L
1942              BAL    STACHK              GO TO STATUS CHECK    7  05664  R 03333 G M
1943              BCE    *&8,SPTADD,1        BRCH IF IN MANUAL MD 12  05671  B 05690 01004 1
1944              B      RANDOM              GO TRY NEXT SEEK      7  05683  J 05560
1945              B      TYP1                GO REQUEST THAT CE-HAD 7 05690  J 01593
1946              DCW    @CE-HAD ON@,G         BE TURNED ON        9  05705
1947              H                          WAIT FOR ACTION       1  05707  .
1948              WU     %F5,FILE,R          READ IN TKHD ADDR    10  05708  M %F5 10991 R
1949              BCBI   *-16                                      7  05718  R 05708 2
1950              BAL    *&1                                       7  05725  R 05732 G M
1951              SW     DATAFD                                    6  05732  . 11000
1952              MLCA   DATAFD&6,ADRMSG&16  MOVE ADDR READ BACK  12  05738  D 11006 05773 T
1953              B      TYP1                GO TYPE ADDR          7  05750  J 01593
1954     ADRMSG   DCW    @ADDR READ          .CE-HAD OFF@,G       28  05757
1955              H      RANDOM              WAIT FOR ACTION       6  05786  . 05560
1956     ENDSKS   MLNA   @9#20@,FILE&5       RESET ADDRESS        12  05792  D 10674 10996 /
1957              MLNS   RDYMSG&8,FILE       RESTORE ACCESS ADDRESS 12 05804  D 07785 10991 1
1958              SD     1,FILE              POSITION ACCESS      10  05816  M %F0 10991 R
1959              BCBI   *-16                                      7  05826  R 05816 2
1960              BAL    *&1                                       7  05833  R 05840 G M
1961     NO7XIT   B      MONITR              GO TO MONITOR         7  05840  J 02101
1962
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1964                  *** TEST ROUTINE DESCRIOPTION ***
1965                  *** TEST WRITE 6 BIT MODE FORMAT ***
1966            THIS ROUTINE WRITES A SHORT FORMAT FOR CYL 250 IN THE 6 BIT
1967          MODE.THE FORMAT IS WRITE CHECKED AND IF A DATA CHECK RESULTS,
1968          ERR 18 IS INDICATED.IN ADDITION ANY STATUS INDICATORS ENCOUNT-
1969          ERED BY THE WRITE FORMAT,OR THE WRITE CHECK,WILL BE DISPLAYED IN
1970          THE ERROR TYPEOUT.
1971
1972          FORMAT WRITTEN ON CYL 250 IN 6 BIT MODE
1973          444444333333333333433333333333341111111112222222222222221111111
1974          111112111111111111211111111111111111122222222222222211111111111112
1975          111111111111211111111111111111222222222222222111111111111211111
1976          111111121111111111111111111111111111111111111111111111111111111
1977          11111111112
1978
1979          ORGANIZATION OF FORMAT
1980          GAP1--HA1--GAP2--HA2 9CHARS--X GAP--REC ADDR 1OCHAR--Y GAP--REC
1981          AREA 14CHARS--X GAP--REC ADDR 1OCHARS--Y GAP--REC AREA 14CHARS--
1982          REC ADDR 1CCHARS--X GAP--REC AREA 64CHARS--GAP3
1983     NO8  NOP                                                   1  05847  N
1984          DC     @08@              RCUTINE ID                  2  05849
1985          CS     DATAFD&399                                    6  05850  / 11399
1986          CS                             DATA                 1  05856  /
1987          CS                                FIELD             1  05857  /
1988          CS                                                  1  05858  /
1989          MLCS   @1@,DATAFD        LOAD                      12  05859  D 10619 11000 3
1990          MLCA   @9#20@,FILE&5     RESET ADDRESS             12  05871  D 10674 10996 T
1991          SM     DATAFD&272                                    6  05883  , 11272
1992          MRN    DATAFD,DATAFD&1     FORMAT                  12  05889  D 11000 11001 9
1993          MLNA   HAAREA,DATAFD&32     SIX BIT                12  05901  D 10353 11032 /
1994          MLNA   GAP6,DATAFD&84          MODE FOR             12  05913  D 10396 11084 /
1995          MLNA   GAP6,DATAFD&144   THREE RECORDS              12  05925  D 10396 11144 /
1996          MLNA   GAP6,DATAFD&204    AND RECORD ADDRESSES      12  05937  D 10396 11204 /D
1997          MRCWG  GAP6,DATAFD&272              REC ADDR         12  05949  D 10396 11272 L
1998          MU     %F7,FILE,W        WRITE THE FORMAT            10  05961  M %F7 10991 W
1999          BCB1   *-16                                          7  05971  R 05961 2G
2000          BAI    STACHK            BRCH ON ANY ERROR           7  05978  R 03333 M
```

```
                    TEST WRITE FORMAT 6 BIT MODE
PGLIN     LABEL     OPCOD  OPERAND
                                                                  CT  ADDRS  INSTRUCTION
2001                WDC    1,FILE                 WRT DISK CHK    10  05985  M %F3 10991 W
2002                BAI    *01                                     7  05995  R 06002 M
2003                BER1   *08                    BRCH ON DATA CHK 7  06002  R 06016 4
2004                B      NOBXIT                                  7  06009  J 06022
2005                     *** SET ERROR 18 ON ***
2006                SW     E18                    SET ERROR IND    6  06016  , 01819
2007          WRITE CHECK OF THE FORMAT RESULTS IN A DATA CHECK
2008      NOBXIT    B      MONITR                                  7  06022  J 02101
2009
```

```
PGLIN   LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2011                  *** TEST ROUTINE DESCRIPTION ***
2012                *** TEST READ&WRITE IN 6 BIT MODE ***
2013          A TRACK OF 100 CHARACTERS IS WRITTEN.THE TRACK IS HDC,READ INTO
2014         MEMORY AND COMPARED TO THE ORIGINAL DATA THAT WAS WRITTEN.IF THE
2015         WRITE CHECK TURNS ON DATA CHECK ERROR 19 IS INDICATED.IF THE READ
2016         DATA DOES NOT COMPARE WITH THE WRITE DATA,ERROR 20 IS INDICATED.
2017         ANY STATUS INDICATORS ENCOUNTERED WILL BE DISPLAYED.THE TEST IS
2018         REPEATED 40 TIMES,ONCE FOR EACH HEAD ON THE ACCESS AT CYL 250
2019
2020         FORMAT REQUIRED SAME AS THE FORMAT DESCRIBED IN ROUTINE NO8
2021
2022         DATA FIELD ORGANIZATION
2023         HA2 2CHARS--REC ADDR 6CHARS--RECORD 10CHARS--REC ADDR 6CHARS--
2024         RECORD 1CCHARS--REC ADDR 6CHARS--RECORD 60CHARS
2025         DATA FIELD USED
2026         @@ADDR01###---&&& ADDR0212488421  ADDR03.¤  $*   -/,%  **@   &ABC
2027         DEFGHI-JKLMNOPQR*STUVWXYZ035679
2028
2029   NO9       NCP                                                      1  06029  N
2030             DC      @09@              ROUTINE ID                     2  06031
2031             MLCA    @9*20@,FILE&5     RESET ADDRESS                 12  06032  D 10674 10996 T
2032             B       *&30                                             7  06044  J 06080
2033   CHKHDS    SW      FILE&4                                           6  06051  . 10995
2034             A       @1@,FILE&5        UPDATE TKHD ADDR              11  06057  A 10619 10996
2035             BCE     NO9XIT,FILE&4,6   BRCH IF CYL COMPLETE          12  06068  B 06227 10995 6
2036             CS      DATAFD&225        CLEAR                          6  06080  / 11225
2037             CS                              DATA                     1  06086  /
2038             CS                                 FIELD                 1  06087  /                D
2039             MRCWG   HACP,DATAFD       LOAD THE DATA FIELD           12  06088  D 10398 11000 L
2040             MU      *F5,FILE,W        WRITE THE RECORDS             10  06100  M *F5 10991 W
2041             BAI     STACHK            BRCH ON ANY ERROR              7  06110  R 03333 M
2042             WDC     1,FILE            WRITE CHECK THE DATA          10  06117  M *F3 10991 W
2043             BERI    *&15              BRCH ON DATA CHK               7  06127  R 06148 4
2044             BAI     STACHK            BRCH ON ANY ERROR              7  06134  R 03333 M
2045             B       RDCHK6                                           7  06141  J 06154
2046                  *** SET ERROR 19 ON ***
2047             SW      E19               SET ERROR IND                  6  06148  . 01820
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2048        WRITE CHECK OF RECORD RESULTS IN DATA CHECK
2049      RDCHK6    MRCG   DATAFD,DATAFD&101  SAVE DATA WRITTEN     12  06154  D 11000 11101 $
2050                CS     DATAFD&99          CLEAR DATA FIELD       6  06166  / 11099
2051                MU     %F5,FILE,R         READ DATA BACK        10  06172  M %F5 10991 R
2052                BAI    STACHK             BRCH ON ANY ERROR      7  06182  R 03333 M
                                                                                 G
2053                C      DATAFD&200,DATAFD&99  CHECK DATA READ     11  06189  C 11200 11099
2054                BE     CHKHOS             IF IT IS GOOD BRCH     7  06200  J 06051 S
2055                    *** SET ERROR 20 ON ***
2056                SW     E20                SET ERROR IND          6  06207  , 01821
2057        READ DATA DOES NOT COMPARE WITH ORIGINAL WRITE DATA
2058                B      MONITR             GO REPORT ERROR        7  06213  J 02101
2059                B      CHKHOS              RETURN HERE           7  06220  J 06051
2060      NO9XIT    B      MONITR                                    7  06227  J 02101
2061
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CY  ADDRS  INSTRUCTION

2063                   *** TEST ROUTINE DESCRIPTION ***
2064                 *** TEST WRITE FORMAT 8 BIT MODE ***
2065        THIS ROUTINE WRITES A SHORT FORMAT FOR CYL 250 IN 8 BIT MODE.
2066        THE FORMAT IS WRITE CHECKED AND IF A DATA CHECK RESULTS, ERROR 21
2067        IS INDICATED.ANY STATUS INDICATORS THAT ARE ENCOUNTERED WILL BE
2068        DISPLAYED IN THE ERROR MESSAGE.
2069
2070        FORMAT WRITTEN ON CYL 250 IN 8 BIT MODE
2071        4444443333333333334333333333333334333333333444444444444444433333333
2072        3333343333333333333433333333333333333344444444444444443333333333333
2073        4333333333333343333333333333333334444444444444444333333333333343333
2074        3333333334333333333333333333333333333333333333333333333333333333333
2075        3333333333334
2076        ORGANIZATION OF FORMAT
2077        GAP1--HA1--GAP2--HA2 9CHARS--X GAP--REC ADDR 10CHAR--Y GAP--REC
2078        AREA 14CHARS--X GAP--REC ADDR 10CHARS--Y GAP--REC AREA 14CHARS--
2079        REC ADDR 10CHARS--X GAP--REC AREA 64CHARS--GAP3
2080     N1C        NOP                                              1  06234  N
2081                DC      @1C@              ROUTINE ID             2  06236
2082                CS      DATAFD&399        CLEAR                  6  06237  / 11399
2083                CS                              DATA             1  06243  /
2084                CS                                  FIELD        1  06244  /
2085                CS                                               1  06245  /
2086                MLCS    @3&,DATAFD        LOAD                  12  06246  D 10625 11000 3
2087                MLCA    @9*20@,FILE&5     RESET TRACK & HEAD ADDRESS  12  06258  D 10674 10996 T
2088                SW      DATAFD&277        THE                    6  06270  . 11277
2089                MRN     DATAFD,DATAFD&1     FORMAT               12  06276  D 11000 11001 9
2090                MLNA    HAAREA,DATAFD&32      EIGHT BIT          12  06288  D 10353 11032 /
2091                MLNA    GAP8,DATAFD&84          MODE FOR         12  06300  D 10541 11084 /
2092                MLNA    GAP8,DATAFD&144   THREE RECORDS          12  06312  D 10541 11144 /
2093                MLNA    GAP8,DATAFD&204    AND RECORDS  ADDRESSES  12  06324  D 10541 11204 /D
2094                MRCHG   GAP8,DATAFD&272                 RECORD ADDRESSES  12  06336  D 10541 11272 L
2095                MU      *F7,FILE,W        WRITE THE FORMAT       10  06348  M *F7 10991 W
                                                                                            G
2096                BAI     STACHK            BRCH ON ANY ERROR      7  06358  R 03333 M
2097                WCC     1,FILE            WRITE CHECK FORMAT     10  06365  M *F3 10991 W
                                                                                            G
2098                BAI     *&1                                      7  06375  R 06382 M
2099                BERI    *&8               BRCH ON DATA CHK       7  06382  R 06396 4
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2100                B      NICXIT                                    7  06389  J 06402
2101                    *** SET ERROR 21 ON ***
2102                SW     E21                  SET ERROR IND        6  06396  , 01022
2103      WRITE CHECK OF THE FORMAT RESULTS IN A DATA CHECK
2104      NICXIT    B      MONITR                                    7  06402  J 02101
2105
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2107                 *** TEST ROUTINE DESCRIPTION ***
2108               *** TEST READ&WRITE IN 8 BIT MODE ***
2109          A RECORD OF 100 CHARACTERS,HA2 & 3 RECORDS & 3 RECORD ADDRESSES
2110         .IS WRITTEN USING HAO IN 8 BIT MODE.IT IS WRITE CHECKED,READ BACK
2111         INTO MEMORY,AND COMPARED AGAINIST THE ORIGINAL DATA WRITTEN.IF
2112         THE WRITE CHECK RESULTS IN DATA CHECK,ERROR 22 IS INDICATED.IF
2113         THE READ DATA DOES NOT COMPARE TO THE WRITE DATA ERROR 24 IS
2114         INDICATED.SINCE THE RECORD IS WRITTEN AND READ IN 8 BIT MODE THE
2115         READ DATA IS CHECKED FOR A WORD MARK IN A FIXED LOCATION. IF THE
2116         WORD MARK IS NOT THERE ERROR 23 WILL BE INDICATED.ANY STATUS
2117         ERROR WILL ALSO BE INDICATED.THE TEST IS REPEATED 40 TIMES,ONCE
2118         FOR EACH HEAD ON THE ACCESS AT CYL 250
2119
2120         FORMAT REQUIRED SAME AS THE FORMAT DESCRIBE IN ROUTINE N10
2121
2122         DATA FIELD ORGANIZATION
2123         HA2 2CHARS--REC ADDR 6CHARS--RECORD 10CHARS--REC ADDR 6CHARS--
2124         RECORD 10CHARS--REC ADDR 6CHARS--RECORD 60CHARS
2125         DATA FIELD USED
2126         @8ADDRC1###----&&& ADDR0212488421  ADDR03.¤  $*   -/,%  *#@   &ABC
2127         DEFGHI-JKLMNOPQR#STUVWXYZ035679
2128
2129    N11      NOP                                                    1  06409  N
2130             DC     @11@              ROUTINE ID                    2  06411
2131             MLCA   @9*20@,FILE&5     RESET TRACK & HEAD ADDRESS   12  06412  D 10674 10996 T
2132             CS     DATAFD&299        CLEAR                         6  06424  / 11299
2133             CS                            DATA                     1  06430  /
2134             CS                                FIELD                1  06431  /
2135             MRCWG  MACP,DATAFD       LOAD THE DATA FIELD          12  06432  D 10398 11000 D
                                                                                    L
2136             LU     %F5,FILE,W        WRITE THE DATA               10  06444  L %F5 10991 W
2137             BA1    STACHK            BRCH ON ANY ERROR             7  06454  R 03333 M
                                                                                    G
2138             LU     %F3,FILE,W        WRITE CHECK THE DATA         10  06461  L %F3 10991 W
2139             BER1   *&15              BRCH ON DATA CHECK            7  06471  R 06492 4
                                                                                    G
2140             BA1    STACHK                                          7  06478  R 03333 M
2141             B      RDCHK8                                          7  06485  J 06498
2142                  *** SET ERROR 22 ON ***
2143             SW     E22               SET ERROR IND                 6  06492  , 01823
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2144		WRITE CHECK OF RECORD RESULTS IN A DATA CHECK					
2145	RDCHK8	MRCG	DATAFD,DATAFD&101	SAVE DATA WRITTEN	12	06498	D 11000 11101 6
2146		CS	DATAFD&99	CLEAR DATA FIELD	6	06510	/ 11099
2147		LU	$F5,FILE,R	READ DATA BACK	10	06516	L $F5 10991 R
2148		BAI	STACHK	BRCH ON ANY ERROR	7	06526	R 03333 G M
2149	CHKWR	BW	*&7,DATAFD&2	CHECK RCRD MARKS	12	06533	V 06551 11002 1
2150		*** SET ERROR 23 ON ***					
2151		SW	E23	SET ERROR IND	6	06545	. 01824
2152		&CRD MARK MISSING FROM READ DATA					
2153	DATCK8	C	DATAFD&200,DATAFD&99	CHECK DATA READ	11	06551	C 11200 11099
2154		BE	*&7	IF IT IS GOOD BRCH	7	06562	J 06575 S
2155		*** SET ERROR 24 ON ***					
2156		SW	E24	SET ERROR IND	6	06569	. 01825
2157		READ DATA DOES NOT COMPARE TO WRITE DATA					
2158	N11XIT	B	MONITR		7	06575	J 02101
2159		ALTER ADDRESS BY 1 UNTIL EVERY HEAD					
2160		IS SELECTED AND TESTED IN 8 BIT MODE					
2161	N12	NOP			1	06582	N
2162		DC	@12@	ROUTINE ID	2	06584	
2163		SW	FILE&4		6	06585	. 10995
2164		A	@1@,FILE&5	UPDATE TKHD ADDR	11	06591	A 10619 10996
2165		BCE	N12XIT,FILE&4,6	BRCH IF CYL COMPLETE	12	06602	B 06632 10995 6
2166		ZA	&N11,X3	LOAD IX 3	11	06614	M 10693 00039 Q
2167		B	N11&15		7	06625	J 06424
2168	N12XIT	B	MONITR		7	06632	J 02101
2169							

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

2171                   *** TEST ROUTINE DESCRIPTION ***
2172                 *** TEST FULL TRACK WITH ADDRESSES OPERATION ***
2173          A DATA FIELD OF 3 RECORDS AND ADDRESSES IS WRITTEN IN THE 8 BIT
2174        MODE USING WFT ON CYL 250 ADDR 9#20.THE DATA IS READ
2175        BACK IN 8 BIT MODE USING THE RFT OP AND THE DATA READ IS COMPARED
2176        IN MEMORY WITH THE DATA WRITTEN.IF THE DATA DOESN T COMPARE ERROR
2177        25 IS INDICATED.STATUS ERRORS  ARE ALSO INDICATED.
2178
2179        FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N10
2180
2181        DATA FIELD ORGANIZATION
2182        REC ADDR 6CHARS--RECORD 10CHARS--REC ADDR 6CHARS--RECORD 10CHARS-
2183        -REC ADDR 6CHARS--RECORD 60CHARS
2184
2185        DATA FIELD USED
2186        ADDR01###---&&& ADDR0212488421  ADDR03.¤  $*   -/.%  ##@   &ABCDE
2187        FGHI-JKLMNOPQR*STUVWXYZ035679
2188
2189      N13         NOP                                              1  06639  N
2190                  DC      @13@                ROUTINE ID           2  06641
2191                  CS      DATAFD&299          CLEAR                6  06642  / 11299
2192                  CS                               DATA            1  06648  /
2193                  CS                                   FIELD       1  06649  /
2194                  MRCG    ADDR1-5,DATAFD      LOAD DATA FIELD     12  06650  D 10400 11000 $
2195                  SW      DATAFD&98           SET WM OVER GM       6  06662  , 11098
2196                  MLCA    @9#20@,FILE&5       RESET TRACK ADDRESS 12  06668  D 10674 10996 T
2197                  LU      %F6,FILE,W          WRITE TRK WITH ADDRS 10  06680  L %F6 10991 W
2198                  BAI     STACHK              BRCH ON ANY ERROR    7  06690  R 03333 GM
2199                  MRCG    DATAFD,DATAFD&99    SAVE DATA           12  06697  D 11000 11099 $
2200                  CS      DATAFD&97                                6  06709  / 11097
2201                  LU      %F6,FILE,R          READ TRK WITH ADDR  10  06715  L %F6 10991 R
2202                  BAI     STACHK              BRCH ON ANY ERROR    7  06725  R 03333 GM
2203                  C       DATAFD&97,DATAFD&196  CHECK DATA READ   11  06732  C 11097 11196
2204                  BE      *&7                 IF IT IS GOOD BRCH   7  06743  J 06756 S
2205                      *** SET ERROR 25 ON ***
2206                  SW      E25                 SET ERROR IND        6  06750  , 01826
2207        READ DATA DOES NOT COMPARE WITH DATA WRITTEN
```

TEST FULL TRACK WITH ADDRESSES DC02 PAGE 117

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2208	N13X1T	B.	MONITR	7	06756	J 02101

```
RGLIN   LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2210                     *** TEST ROUTINE DESCRIPTION ***
2211                   *** TEST FULL TRACK WITHOUT ADDRESSES OPERATION ***
2212            A DATA FIELD OF 3 RECORDS IS WRITTEN IN 8 BIT MODE USING THE
2213          NOT OP ON CYL 250 ADDR 9820.THE DATA IS READ BACK USING RDT
2214          OP AND THE DATA READ IS COMPARED AGAINST THAT WHICH WAS WRITTEN.
2215          IF THE DATA DOES NOT COMPARE ERROR 26 IS INDICATED.ALL STATUS
2216          ERRORS ENCCUNTERED ARE ALSC INDICATED.
2217
2218          FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N10
2219
2220          DATA FIELD ORGANIZATION
2221          RECORD 10CHARS--RECORD 10CHARS--RECORD 60CHARS
2222          DATA FIELD USED
2223          $$$---&&& 12488421 .¤  $*   -/,%  **@   &ABCDEFGHI-JKLMNOPQR*STU
2224          VWXYZ035679
2225
2226    N14       NOP                                                    1  06763  N
2227              DC      @14@              ROUTINE ID                   2  06765
2228              CS      DATAFD&299        CLEAR                        6  06766  / 11299
2229              CS                              DATA                   1  06772  /
2230              CS                                  FIELD              1  06773  /
2231              MRCG    ADDR1&1,DATAFD    LOAD DATA FIELD             12  06774  D 10406 11000 $
2232              MRCG    ADDR2&6,DATAFD&10 LOAD                        12  06786  D 10422 11010 $
2233              MRCWG   ADDR3&6,DATAFD&20     DATA FIELD               12  06798  D 10438 11020 L
2234              MLCA    @9*20@,FILE&5     RESET ADDRESS               12  06810  D 10674 10996 T
2235              LU      %F2,FILE,W        WRITE FULL TRACK            10  06822  L %F2 10991 W
2236              BAI     STACHK            BRCH ON ANY ERROR            7  06832  R 03333 M
2237              MRCG    DATAFD,DATAFD&81  SAVE DATA                   12  06839  D 11000 11081 $
2238              CS      DATAFD&79         CLEAR STORAGE                6  06851  / 11079
2239              LU      %F2,FILE,R        READ TRACK                  10  06857  L %F2 10991 R
2240              BAI     STACHK                                         7  06867  R 03333 M
2241              C       DATAFD&79,DATAFD&160  CHECK DATA READ         11  06874  C 11079 11160
2242              BE      *&7               IF IT IS GOOD BRCH           7  06885  J 06898 S
2243                   *** SET ERRCR 26 ON ***
2244              SW      E26                                            6  06892  . 01827
2245          READ DATA DOES NOT COMPARE WITH DATA WRITTEN
2246    N14XIT    B       MONITR                                         7  06898  J 02101
```

TEST FULL TRACK WITHOUT ADDRESSES DC02

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION

```
PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2248                  *** TEST ROUTINE DESCRIPTION ***
2249                *** TEST SINGLE RECORD OPERATION ***
2250          IN THE EIGHT BIT MODE A SINGLE RECORD OF 10 CHARACTERS IS WRIT-
2251        TEN,ADDRESS-ADDR01.IF NO RECORD FOUND RESULTS,ERROR 27 IS
2252        INDICATED.A READ SINGLE RECORD  RECORD ADDRESS ADDR03  IS ISSUED
2253        AND IF A NO RECORD FOUND RESULTS ERROR 28 IS INDICATED.THE DATA
2254        READ BACK IS CHECKED TO INSURE THE PROPER RECORD WAS READ,IF IT
2255        IS NOT THE CORRECT DATA,ERROR 29 IS INDICATED.ALL STATUS ERRORS
2256        WILL BE INDICATED.
2257
2258        FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N10
2259
2260        RECORD ADDRESS & DATA FIELD USED IN WRITE SINGLE RECORD,THE REC-
2261        ORD ADDRESS WAS WRITTEN IN ROUTINE 13
2262        --ADDR01 3333333334
2263
2264        RECORD ADDRESS USED AND RECORD EXPECTED IN READ SINGLE RECORD
2265        --ADDR03 .¤  $*   -/,%  *#@   &ABCDEFGHI-JKLMNOPQR*STUVWXYZ035679
2266
2267
2268     N15       NOP                                                    1  06905  N
2269               DC     @15@              ROUTINE ID                    2  06907
2270               CS     DATAFD&299        CLEAR                         6  06908  / 11299
2271               CS                           DATA                      1  06914  /
2272               CS                              FIELS                  1  06915  /
2273               MLCA   ADDR1,FILE&7      SET RECORD ADDR              12  06916  D 10405 10998 T
2274               MRCWG  GAP8-9,DATAFD     LOAD DATA FIELD              12  06928  D 10532 11000 D L
2275               LU     %F1,FILE,W        WRITE SINGLE RECORD          10  06940  L %F1 10991 W
2276               BNT1   *&15              BRCH NO TRAN                  7  06950  R 06971 S B
2277               BA1    STACHK            BRCH ON ANY ERROR             7  06957  R 03333 G M
2278               B      SRCRD                                           7  06964  J 06977
2279                   *** SET ERROR 27 ON ***
2280               SW     E27               SET ERROR IND                 6  06971  . 01828
2281          WRITE SINGLE RECORD RESULTS IN NO RECORD FOUND
2282     SRCRD     CS     DATAFD&99         CLEAR DATA FIELD              6  06977  / 11099
2283               MLCA   ADDR3&5,FILE&7    SET RECORD ADDR              12  06983  D 10437 10998 T
2284               MLCWS  &M@,DATAFD&60      SET WMGM                     12  06995  D 10617 11060 7
                                  G
```

```
PGLIN   LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

2285             LU     %F1,FILE,R          READ SINGLE RECORD   10  07007  L %F1 10991 R
2286             BNT1   *&15                BRCH NO TRANS         7  07017  R 07038 S
2287             BA1    STACHK              BRCH ON ANY ERRORS    7  07024  R 03333 B
2288             B      SRCCHK                                    7  07031  J 07044 G
2289                 *** SET ERROR 28 ON ***                                 H
2290             SW     E28                 SET ERROR IND         6  07038  , 01829
2291       READ SINGLE RECORD RESULTS IN NO RECORD FOUND
2292   SRCCHK    SW     DATAFD                                    6  07044  , 11000
2293             C      ACCR3&65,DATAFD&59  CHECK DATA READ      11  07050  C 10497 11059
2294             BE     N15XIT-12           IF IT IS GOOD BRCH    7  07061  J 07074 S
2295                 *** SET ERROR 29 ON ***
2296             SW     E29                                       6  07068  , 01830
2297       RECORD READ WAS NOT RECORD EXPECTED
2298             MLCA   CETKHD,FILE&7       RESTORE FILE ADDR    12  07074  D 10558 10998 T
2299   N15XIT    B      MONITR                                    7  07086  J 02101
2300
```

```
PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2302                        *** TEST ROUTINE DESCRIPTION ***
2303                      *** TEST CYLINDER OPERATION ***
2304          WITH A DATA FIELD OF 9 RECORDS  240 CHARS  3 TRACKS ARE WRITTEN
2305        USING THE CYLINDER OPTION.THIS IS DONE ON EVERY 3 TRACKS UNTIL
2306        THE ENTIRE CYLINDER IS COMPLETED,CYL 250. THE ADDRESS IS RESET
2307        AND A READ CYLINDER OP OF 3 TRACKS IS PERFORMED.THE READ DATA IS
2308        COMPARED TO THE ORIGINAL WRITE DATA AND IF THEY DO NOT COMPARE
2309        ERROR 30 IS INDICATED.THE READ IS REPEATED FOR EVERY 3 TRACKS
2310        ALSO.THIS TEST IS RUN ONLY IF CYO IS AVAILABLE.
2311
2312        FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N10
2313
2314        DATA FIELD ORGANIZATION
2315        RECORD 10CHARS--RECORD 10CHARS--RECORD 60CHARS REPEAT 2 TIMES
2316
2317        DATA FIELD USED TO WRITE 3 TRACKS
2318        YYY-3 RECORDS OF 80 Y EACH-YYYY
2319
2320     N16        NOP                                                      1  07093  N
2321                DC      &16&              ROUTINE ID                     2  07095
2322                BCE     *68,SPTADD,1      BRCH IF IN MANUAL MD          12  07096  B 07115 01004 1
2323                B       N16XIT                                           7  07100  J 07396
2324                B       TYP2              GO TYPE MESSAGE                7  07115  J 01607
2325                DCW     &CYO AVAIL&,G                                    9  07130
2326                DC      &  &,G            ANSWER                         1  07132
2327                BCE     *68,*-13,1        BRCH IF CYO IS AVAIL          12  07134  B 07153 07132 1
2328                B       N16XIT                                           7  07146  J 07396
2329                CS      DATAFD&299        CLEAR                          6  07153  / 11299
2330                CS                              DATA                     1  07159  /
2331                CS                                  FIELD                1  07160  /
2332                MLCA    CETKHD,FILE&7     SET HA1 & HA2                 12  07161  D 10558 10998 T
2333                MLCS    &Y&,DATAFD        LOAD                          12  07173  D 10694 11000 3
2334                SW      DATAFD&239,FILE&4     THE                       11  07185  , 11239 10995
2335                MRC     DATAFD,DATAFD&1           DATA                  12  07196  D 11000 11001 #
2336                CW      DATAFD&239                                       6  07208  ¤ 11239
2337                MLCWS   &M&,DATAFD&240                                  12  07214  D 10617 11240 7
2338     CYCWRT     LU      %F&,FILE,W        WRITE CYO                     10  07226  L %F& 10991 W
```

```
PGLIN    LABEL    OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION.
2339              BAL    STACHK           BRCH ON ANY ERROR  7  07236  R 03333 GM
2340              A      @3@,FILE&5       UPDATE TRK ADDR BY 3 11 07243  A 10625 10996
2341              C      FILE&5,@59@      IS THIS HEAD 39    11  07254  C 10996 10696
2342              BE     *&8              IF SO BRCH          7  07265  J 07279 S
2343              B      CYCWRT                               7  07272  J 07226
2344              MLCA   @9#20@,FILE&5    RESET ADDRESS      12  07279  O 10674 10996 T
2345    CYCRD     CS     DATAFO&239       CLEAR              6  07291  / 11239
2346              CS                           DATA           1  07297  /
2347              CS                               FIELD      1  07298  /
2348              LU     %F@,FILE,R       READ CYO           10  07299  L %F@ 10991 R
2349              BEX1   STACHK,MS        BRCH ON ANY EUT WLR 7  07309  R 03333 SM
2350              BAL    *&1                                  7  07316  R 07323 MG
2351              SW     DATAFO                               6  07323  , 11000
2352              C      DATAFO&239,DATAFO&238  CHECK DATA READ 11 07329  C 11239 11238
2353              BE     *&14             IF IT IS GOOD BRCH  7  07340  J 07360 S
2354                  *** SET ERROR 30 ON ***
2355              SW     E30                                  6  07347  , 01831
2356      READ DATA DOES NOT COMPARE WITH DATA WRITTEN
2357              B      N16XIT                               7  07353  J 07396
2358              A      @3@,FILE&5       UPDATE ADDR BY 3   11  07360  A 10625 10996
2359              C      FILE&5,@59@      IS THIS HEAD 39    11  07371  C 10996 10696
2360              BE     *&8              IF IT IS BRCH       7  07382  J 07396 S
2361              B      CYCRD                                7  07389  J 07291
2362    N16XIT    B      MONITR                               7  07396  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2364                   *** TEST ROUTINE DESCRIPTION ***
2365                *** TEST INTERUPT FROM 7631-1301 ***
2366          THIS TEST IS RUN WHEN THE PRIORITY FEATURE IS AVAILABLE.A SEEK
2367        CYL 000 IS ISSUED.THE PROGRAM ENTERS THE ALERT MODE AND WAITS IN
2368        A LOOP FOR THE INTERUPT.AFTER CERTAIN TIME.IF NO INTERUPT OCCURES
2369        ERROR 31 IS INDICATED.STATUS ERRORS ARE ALSO INDICATED.
2370
2371      N17       NOP                                               1  07403  N
2372                DC      @17@              ROUTINE ID              2  07405
2373                BCE     *68,1264,1        BRCH IF PRIORITY AVL   12  07406  B 07425 01264 1
2374                B       N17XIT                                    7  07418  J 07517
2375                MLCA    CETKHD,FILE67     RESET ADDRESS          12  07425  D 10558 10998 T
2376                SC      1,FILE            MOVE THE ACCESS        10  07437  M %F0 10991 R
2377                BCB1    *-16                                      7  07447  R 07437 2
2378                BA1     STACHK            BRCH  ON ANY ERROR      7  07454  R 03333 H
2379                BEPA    *61               ENTER ALERT MODE        7  07461  Y 07468 E
2380                S       X7                RESET IX 7              6  07468  S 00059
2381      INTLUP    A       @1@,X7            WAIT FOR DELAY         11  07474  A 10619 00059
2382                BCE     N17XIT,X7-3,4     BRCH IF DELAY COMPLETE 12  07485  B 07517 00056 4
2383                B       INTLUP                                    7  07497  J 07474
2384      NOINTR    BXPA    *61               EXIT ALERT MODE         7  07504  Y 07511 X
2385                     *** SET ERROR 31 ON ***
2386                SW      E31               SET ERROR IND           6  07511  . 01832
2387          NO INTERUPT AT THE COMPLETION OF THE SEEK OP
2388      N17XIT    B       MONITR                                    7  07517  J 02101
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2350                    *** CHANNEL AND MODULE ADDRESS UPDATE ROUTINE ***
2351          THIS ROUTINE LOCATES CHANNELS WITH 7631 ON THEM AND CAUSES
2352          THE PROGRAM TO BE INITIALIZED ACCORDINGLY AND LOCATES READY
2353          ACCESSES ON THE CHANNEL.AS LONG AS THERE ARE UNTESTED READY ACC
2354          AVAILABLE THIS ROUTINE WILL LOOP BACK TO ROUTINE N01 OR N07.WHEN
2355          THERE ARE NO MORE UNTESTED ACCESSES ON ANY CHANNEL THIS ROUTINE
2356          FALLS THROUGH TO MONITOR.THE UPDATE ROUTINE STARTS WITH CHANNEL 1
2357
2358    N18       NOP                                                    1  07524  N
2359              DC     8182              ROUTINE TO                    2  07526
2360              B      TOP&7                                           7  07527  J 07622
2361              BCE    *&8,0&X1C,F       FILES ON THIS CHNL            12  07534  B 07553 00**0 F
2362              B      UPCHNL            GO UP DATE FOR NEXT           7  07546  J 07681
2363              MLCA   CODE3&X15,INCODE  MOVE CHANNEL CODES            12  07553  D 10EF2 07584 T
2364              B      CHALTR            GO TO CHANNEL ALTER           7  07565  J 01045
2365              DCW    TOP               HIGH LIMIT                    5  07576  07615
2366              DC     BOTTOM            LOW LIMIT                     5  07581  04292
2367              DCW    @ @                                             1  07582
2368              DC     @ @                                             1  07583
2369    INCODE    DC     @ @                                             1  07584
2370              SW     CHNLSW&1          TURN ON CHANNEL SW            6  07585  , 07853
2371    RDYFIL    SC     1,FILE            SEEK THE ACCESS               10  07591  M 2F0 10991 R
2372              BNR1   *&15              BRCH NOT READY                7  07601  R 07622 1
2373              BA1    *&1                                             7  07608  R 07615 M
2374    TOP       B      GOTIT             BRCH,FOUND A RDY MOD          7  07615  J 07722
2375              A      @1@,FILE          UPDATE ACCESS                 11  07622  A 10619 10991
2376              BCE    RDYFIL,FILE,1     BRCH IF NO ACCESS OVERFLOW    12  07633  B 07591 10991 1
2377              S      @2@,FILE          RESET ACCESS ADDRESS          11  07645  S 10632 10991
2378              A      @1@,FILE&1        UPDATE MOD ADDR               11  07656  A 10619 10992
2379              BZ     *&8               BRCH IF TEN MOD TRID          7  07667  J 07681 V
2380              B      RDYFIL            GO TRY ANOTHER MOD            7  07674  J 07591
2381    UPCHNL    A      @57@,X10          UPDATE                        11  07681  A 10698 00074
2382              A      @3@,X15                 IND REG 10&15           11  07692  A 10625 00099
2383              BCE    N18XIT,X15-1,1    BRCH IF ALL CHNLS CHECKED     12  07703  B 07902 00098 1
2384              B      N18&10            GO CHK NEXT CHNL              7  07715  J 07534
2385    GOTIT     MLNS   FILE&1,RDYMSG&14  MOVE MOD ADDR                 12  07722  D 10992 07791 1
2386              MLCB   FILE&1,AVAIA8&X15 SAVE ACCESS & MOD ADR          12  07734  D 10992 10E18 L
```

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PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2427                MLNS   FILE,RDYMSG&8        MOVE ACCESS ADDR          12  07746  D 10991 07785 1
2428                MLNS   INCODE,RDYMSG&19      MOVE CHANNEL NUMBER       12  07758  0 07584 07796 1
2429                B      TYP1                                            7  07770  J 01593
2430      RDYMSG    DCW    @TST ACC   MOD   CH  @,G                       20  07777
2431                B      TYP1                                            7  07798  J 01593
2432                DCW    @TURN ON FORMAT,CE-WRT,&HAD FOR THIS ACC & MOD@,G 45  07849
2433                H                           WAIT FOR ACTION            1  07851  .
2434      CHNLSW    NOPWM                                                   1  07852  N
2435                B      NUCHNL               CHANNEL SWITCH             7  07853  J 07878
2436                ZA     &NC7,X3              LOAD IX 3                 11  07860  M 10703Q 00039
2437                B      O&X3                                            7  07871  J 000MQ0
2438      NUCHNL    CW     CHNLSW&1             TURN OFF CHANNEL SW        6  07878  ¤ 07853
2439                ZA     &NC1,X3              LOAD IX 3                 11  07884  M 10708Q 00039
2440                B      O&X3                                            7  07895  J 000MQ0
2441      N18XIT    B      MONITR               GO TO MONITOR              7  07902  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2443
2444                    *** TEST ROUTINE DESCRIPTION ***
2445                  *** TEST FILES & TAPES OVERLAPPED ***
2446          THIS ROUTINE USES FILES ON EVERY CHANNEL WHICH HAS THEM.ON
2447        CHANNELS WHICH DO NOT HAVE FILES,TAPES ARE USED.IF NEITHER FILES
2448        OR TAPES ARE AVAILABLE THE CHANNEL IS BY-PASSED.STARTING WITH
2449        CHANNEL 1 AN OVERLAPPED WRITE OP IS GIVEN TO FILES OR TAPE.THEN
2450        CHANNEL 2 IS STARTED AND THEN 3 AND 4.CHANNEL 1 IS CHECKED AGAIN
2451        IF IT IS IN OVERLAP CHANNEL 2 IS CHECKED AND SO ON,WHEN A CHANNEL
2452        IS FOUND TO BE OUT OF OVERLAP ANOTHER WRITE IS INITIATED ON THE
2453        CHANNEL.AFTER 500 WRITES HAVE BEEN ISSUED THE FILES ARE ISSUED
2454        READ OPS.WHEN 500 READS HAVE BEEN INIATED THE OVERLAP OP-
2455        ERATIONS ARE STOPPED.THE DATA READ IS CHECKED IN MEMORY AND ERROR
2456        36 IS GIVEN IF IT IS INVALID.THE PROG DELAYS 1.5 SECONDS AND THEN
2457        EVERY CHANNEL THAT WAS USED IS CHECKED FOR OVERLAP IN PROCESS. IF
2458        ANY ARE FOUND TO BE IN PROCESS AN ERROR IS INDICATED,FOR CH1
2459        ERROR 32,FOR CH2 ERROR 33,FOR CH3 ERROR 34,FOR CH4 ERROR 35.ALL
2460        STATUS ERRORS WILL BE INDICATED ALSO.
2461        FORMAT REQUIRED IS THE SAME AS DESCRIBED IN ROUTINE N1C
2462        DATA FIELD USED FOR FILES ON CYL 253 ADDRESS 9820
2463
2464        DATA FIELD USED FOR TAPES  TAPE UNIT 1
2465     N19        NOP                                                      1  07909  N
2466                DC      @19@              ROUTINE ID                     2  07911
2467                BCE     *&8,1263,1        BRCH IF OVERLAP AVAIL          12  07912  B 07931 01263 1
2468                B       N19XIT                                           7  07924  J 09281
2469                BCE     *&9,SPTAC0,1      MANNUAL OPERATION              12  07931  B 07950 01004 1
2470                B       N19XIT                                           7  07943  J 09281
2471     RESET      NOPWM                                                    1  07950  N
2472                B       NOWGO                                            7  07951  J 08389
2473                SW      RESET&1                                          6  07958  , 07951
2474                MLCA    @9820@,FILE&5     RESET FILE ADDR                12  07964  D 10674 10996 T
2475                MLCA    AVATAB,FILE&1     LOAD ACCESS & MOD ADR FOR CHL 1 12  07976  D 10598 10992 T
2476                MU      %FC,FILE,R        POSITION CHL 1 ACCESS          10  07988  M %F0 10991 R
2477                BC81    *-16                                             7  07998  R 07988 2
2478                BA1     *&1                                              7  08005  R 08012 M
2479                SC      1,FILE            WAIT FOR BUSY TO DROP          10  08012  M %F0 10991 R
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PGLIN    LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2480              BCB1   *-16                                              7  08022  R 08012 2
2481              BA1    *&1                                               7  08029  R 08036 G
2482              MLCA   AVATAB&3,FILE&1      LOAD ACC&MOD ADDR FOR CHL 2  12  08036  D 10601 10992 T
2483              MU     ¤F0,FILE,'           POSITION CHL 2 ACCESS        10  08048  M ¤F0 10991 R
2484              BCB1   *-16                                              7  08058  R 08048 2
2485              BA1    *&1                                               7  08065  R 08072 G
2486              MU     ¤FC,FILE,R           WAIT FOR BUSY TO DROP        10  08072  M ¤F0 10991 R
2487              BCB1   *-16                                              7  08082  R 08072 2
2488              BA1    *&1                                               7  08089  R 08096 G
2489              BCE    POSCH4,127C,         BRCH IF NO CHL 3             12  08096  B 08217 01270
2490              MLCA   AVATAB&6,FILE&1      LOAD ACC&MOD ADDR FOR CHL 3  12  08108  D 10604 10992 T
2491              MU     &FC,FILE,R           POSITION CHL 3 ACCESS        10  08120  M QF0 10991 R
2492              BCB1   *-16                                              7  08130  R 08120 2
2493              BA1    *&1                                               7  08137  R 08144 G
2494              DC     @READ,INSURE MOD 0 ACC 0 IS SET TO THE CE CYL FOR @  49  08192
2495              MU     &FC,FILE,R           WAIT FOR BUSY TO DROP        10  08193  M QF0 10991 R
2496              BCB1   *-16                                              7  08203  R 08193 2
2497              BA1    *&1                                               7  08210  R 08217 G
2498    POSCH4    BCE    INSTCE,127C,         BRCH IF NO CHL 4             12  08217  B 08289 01270
2499              MLCA   AVATAB&9,FILE&1      LOAD ACC&MOD ADDR FOR CHL4   12  08229  D 10607 10992 T
2500              MU     -FC,FILE,R           POSITION CHL 4 ACCESS        10  08241  M .F0 10991 R
2501              BCB1   *-16                                              7  08251  R 08241 2
2502              BA1    *&1                                               7  08258  R 08265 G
2503              MU     -FC,FILE,R           WAIT FOR BUSY TO DROP        10  08265  M .F0 10991 R
2504              BCB1   *-16                                              7  08275  R 08265 2
2505              BA1    *&1                                               7  08282  R 08289 G
2506    INSTCE    8      TYP1                                              7  08289  J 01593
2507              CCW    @PRESS COMPUTER RESET,SET ALL FORMAT SWITCHES TO @  48  08343
2508              DC     @READ,THEN PRESS START TO BEGIN OVERLAP TEST@,G   43  08386
2509              H                                                         1  08388  .
2510    NOWGO     CW     RESET&1                                           6  08389  ¤ 07951
2511              CW     RDRWF&1,ERRONF&1     CLEAR RD OR WRT SW           11  08395  ¤ 08637 08664
2512              CW     ERRONT&1,CKCHL1&1    CLEAR ERROR SW               11  08406  ¤ 08929 08695
2513              CW     CKCH11&1,CKCH12&1                                 11  08417  ¤ 08870 08960
2514              MLNA   @0C@,FILE&1          SET ACC & MOD ADDR           12  08428  D 10653 10992 /
2515              MLCA   CETKHD,FILE&7        RESET FILE ADDR              12  08440  D 10558 10998 T
2516    RESETX    ZA     @01331@,X1C          LOAD IX 10                   11  08452  M 10713 00074
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PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2517                ZA     @1291@,X11          LOAD IX 11           11  08463  QM 10717 00079
2518                ZA     @000002,X12         LOAD IX 12           11  08474  QM 10651 00084
2519      FILE1     BCE    MOVCOD,0&X10,F      FILES AVAIL          12  08485  B 08561 00..0 F
2520      TAPE1     BCE    MOVCOD,0&X11,1      TAPES AVAIL          12  08497  B 08561 00.QM0 1
2521      UPINDX    A      @57@,X10            UPDATE IX 10         11  08509  A 10698 00074
2522                A      @57@,X11            UPDATE IX 11         11  08520  A 10698 00079
2523                A      @3@,X12             UPDATE IX 12         11  08531  A 10625 00084
2524                BCE    RESETX,X10,QM       BRCH IF ALL CHLS CHKD    12  08542  B 08452 00074 QM
2525                B      FILE1               GO FIND FILE OR TAPE      7  08554  J 08485
2526      MOVCOD    BCE    TAPE1,AVATAB&X12,   BRCH IF NO FILE READY ON THIS CHL  12  08561  B 08497 10E98
2527                MLCA   AVATAB&X12,FILE&1   MOVE ACC&MOD ADDR FOR THIS CHL  12  08573  D 10E98 10992 T
2528                MLCA   OPCODE3&X12,INITL1  LOAD CHANNEL CODES FOR OVLP  12  08585  D 10E74 08616 T
2529                B      CHALTR              GO TO CHANNEL ALTER        7  08597  J 01045
2530                CCW    FRCM                                           5  08608  08998
2531                DC     TO                                             5  08613  08644
2532                CCW    @@@                                            1  08614
2533                DC     @R@                                            1  08615
2534      INITL1    DC     @1@                                            1  08616
2535                BCE    *&8,0&X10,F         FILE OR TAPE AVAIL       12  08617  B 08636 00..0 F
2536                B      TAPECP                                         7  08629  J 08897
2537      RORWF     NOPWM                                                 1  08636  N
2538                B      RDFILE              READ - WRITE SW            7  08637  J 08722
2539      TO        MRCHG  IOCP,DATAFC         LOAD THE DATA FIELD      12  08644  D 10398 11000 DL
2540                BCL1   UPINDX              BRCH ON OVERLAP            7  08656  J 08509 1
2541      ERRONF    NOPWM                                                 1  08663  N
2542                BA1    FILERW              BRCH ON ANY IND            7  08664  R 08688 GM
2543                LU     @F5,FILE,W          WRITE HAD OVERLAP         10  08671  L @F5 10991 W
2544                B      WRTCNT              GO TO WRITE COUNT          7  08681  J 09012
2545      FILERW    SW     CKCHL1&1                                       6  08688  . 08695
2546      CKCHL1    NOPWM                                                 1  08694  N
2547                BA1    *&1                 CLEAR I/O INTRLK ON        7  08695  R 08702 GM
2548                CW     CKCHL1&1                CHANNEL 1              6  08702  ¤ 08695
2549                BA1    STACHK              GO TO STATUS CHECK         7  08708  R 03333 GM
2550                B      FILERW-17                                      7  08715  J 08671
2551      RDFILE    BCL1   UPINDX              BRCH OVERLAP IN PROCCESS   7  08722  J 08509 1
2552                BA1    FILERR              BRCH ON ANY ERROR          7  08729  R 08863 GM
2553                C      DATAFD&99,ADDR3&65  CHECK DATA READ           11  08736  C 11099 10497
2554                B      *-9                                           087  J / 51 S
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PGLIN   LABEL    OPCOD   OPERAND                    CT  ADDRS  INSTRUCTION
2555             B       OVLERR             REPORT ERROR  7  08754  J 08815
2556             C       DATAFD&33,ADDR2&15 CHECK DATA READ 11 08761  C 11033 10431
2557             BE      *&8                           7  08772  J 08786 S
2558             B       OVLERR                        7  08779  J 08815
2559             C       DATAFD&17,ADDR1&15 CHECK DATA READ 11 08786  C 11017 10420
2560             C       DATAFD&17,ADDR1&10 CHECK DATA READ 11 08797  C 11017 10415
2561             BE      *&14                          7  08808  J 08828 S
2562   OVLERR    SW      E36                TURN ON ERROR IND 6 08815  , 01837
2563             B       FILERR                        7  08821  J 08863
2564             CS      DATAFD&99                     6  08828  / 11099
2565             MLCWS   @MG,DATAFD&1CO     SET TERMINATING WMGM 12 08834 D 10617 11100 7
2566             LU      @F5,FILE,R         READ HAD OVERLAP 10 08846  L @F5 10991 R
2567             B       RDCNT              GO TO READ COUNT 7  08856  J 08987
2568   FILERR    SW      CKCH11&1                      6  08863  , 08870
2569   CKCH11    NOPWM                                 1  08869  N
2570             BAI     *&1                CLEAR I/O INTRLK ON 7 08870 R 08877 GM
2571             CW      CKCH11&1               CHANNEL 1  6  08877  ¤ 08870
2572             BAI     STACHK             GO TO STATUS CHECK 7 08883 R 03333 GM
2573             B       FILERR-17                     7  08890  J 08846
2574   TAPBGP    MLCWS   @MG,CATAFD&244     SET FIELD LENGTH 12 08897 D 10617 11244 7
2575             BCLI    UPINDX             BRCH OVL-IN-PROCESS 7 08909 J 08509 1
2576             MRCWG   ADDR1,DATAFD&101   LOAD DATA FIELD 12 08916  D 10405 11101 DL
2577   ERRCNT    NOPWM                                 1  08928  N
2578             BAI     TAPERW             BRCH ON ANY ERROR 7 08929 R 08953 GM
2579             LU      @B1,DATAFD&101,W   WRITE TAPE OVERLAP 10 08936 L @B1 11101 W
2580             B       WRTCNT             GO TO WRITE COUNTER 7 08946 J 09012
2581   TAPERW    SW      CKCH12&1                      6  08953  , 08960
2582   CKCH12    NOPWM                                 1  08959  N
2583             BAI     *&1                CLEAR I/O INTRLK ON 7 08960 R 08967 GM
2584             CW      CKCH12&1               CHANNEL  6  08967  ¤ 08960
2585             BAI     STACHK             GO TO STATUS CHECK 7 08973 R 03333 GM
2586             B       TAPERW-17                     7  08980  J 08936
2587   RDCNT     A       @1&,OVLCNT         UPDATE PASS COUNT 11 08987 A 10619 10545
2588   FRCM      BZ      CHKOVL             BRCH IF 100 PASSES 7 08998 J 09066 V
2589             B       UPINDX             GO TRY ANOTHER CHL 7 09005 J 08509
2590   WRTCNT    A       @1&,OVLCNT         UPDATE PASS COUNT 11 09012 A 10619 10545
2591             SW      ERRCNF&1,ERRCNT&1  SET ERROR SWS 11 09023  , 08664 08929
2592             BCE     SETROF,OVLCNT-2,5  BRCH ON 500TH PASS 12 09034 B 09053 10543 5
```

```
PGLIN   LABEL     OPCOD  OPERAND                  CT  ADDRS  INSTRUCTION
2593              B      UPINDX                    7  09046  J 08509
2594    SETRDF    SW     RDRWF&1                   6  09053  , 08637
2595              B      UPINDX                    7  09059  J 08509
2596    CHKOVL    S      DELAY                     6  09066  S 10550
2597    WAIT      A      @1@,DELAY                11  09072  A 10619 10550
2598              BZ     *&8                       7  09083  J 09097 V
2599              B      WAIT                      7  09090  J 09072
2600              BCE    *&8,1268,1               12  09097  B 09116 01268 1
2601              B      CKOVL2                    7  09109  J 09143
2602              BCL1   *&8                       7  09116  J 09130 1
2603              B      *&7                       7  09123  J 09136
2604                  *** SET ERROR 32 ON ***
2605              SW     E32                       6  09130  , 01833
2606      CHANNEL 1 HUNG IN OVERLAP IN PROCESS
2607              BA1    *&1                       7  09136  R 09143 GM
2608    CKOVL2    BCE    *&8,1269,1               12  09143  B 09162 01269 1
2609              B      CKOVL3                    7  09155  J 09189
2610              BCL2   *&8                       7  09162  J 09176 2
2611              B      *&7                       7  09169  J 09182
2612                  *** SET ERROR 33 ON ***
2613              SW     E33                       6  09176  , 01834
2614      CHANNEL 2 HUNG IN OVERLAP IN PROCESS
2615              BA2    *&1                       7  09182  X 09189 GM
2616    CKOVL3    BCE    *&8,1270,1               12  09189  B 09208 01270 1
2617              B      CKOVL4                    7  09201  J 09235
2618              DCW    @J@                       1  09208
2619              DC     CKOVL4-6                  5  09213  09229
2620              DC     @3@                       1  09214
2621              B      *&7                       7  09215  J 09228
2622                  *** SET ERROR 34 ON ***
2623              SW     E34                       6  09222  , 01835
2624      CHANNEL 3 HUNG IN OVERLAP IN PROCESS
2625              DCW    @3@                       1  09228
2626              DC     CKOVL4                    5  09233  09235
2627              DC     @M@G                      1  09234
2628    CKOVL4    BCE    *&8,1271,1               12  09235  B 09254 01271 1
2629              B      NIGXIT                    7  09247  J 09281
263               D      ?                         *  0925
```

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
2631                DC     N19XIT-6                         5  09259  09279
2632                DC     @46                              1  09260
2633                B      N19XIT                           7  09261  J 09281
2634                     *** SET ERROR 35 ON ***
2635                SH     E35                 SET ERROR IND 5  09268  , 01036
2636          CHANNEL 4 HANG IN OVERLAP IN PROCESS
2637                DCH    @12                              1  09274
2638                DC     N19XIT              CLEAR I/O INTRLK 5  09279  09281
2639                DC     @4@                              1  09280
2640      N19XIT    B      MONITR                           7  09281  J 02101
2641
```

PGLIN	LABEL	OPCOD	OPERAN		CT	ADDRS	INSTRUCTION
2643		***	END TEST ROUTINE ***				
2644	ENDTST	BX	SUPIT,NOERSW&1		12	09288	V 03971 02879 1
2645		B	TYP1		7	09300	J 01593
2646		DCW	&PASS0,6		4	09310	
2647	CHKREP	BCE	02000,TAG3,1	BRCH IF REPEATING	12	09312	B 02000 01002 1
2648		B	TYP1		7	09324	J 01593
2649		DCW	&INSURE ALL FORMAT & CE-NRT SNS ARE OFF&,6		38	09360	
2650		H		WAIR FOR ACTION	1	09370	.
2651		B	40C	GO TO LOADER	7	09371	J 00400
2652							

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2654                 *** PREPARE ONE INSTRUCTION LOOP AND DATA FIELD ***
2655                 *** ACCORDING TO CE REQUEST ***
2656           WHEN THE CE SELECTS THE PROGRAM OPTION FOR ONE INSTRUCTION LOOP
2657         ING,THIS ROUTINE TAKES THE DATA ENTERED BY THE CE AND BUILDS THE
2658         DATA FIELD AND LOOP INSTRUCTION FROM IT.WHEN IT HAS COMPLETED
2659         THIS IT POSITIONS THE ACCESS TO THE ADDRESS ENTERED AND BRANCHES
2660         TO THE LOOP ROUTINE.
2661
2662      PREP       MLCA   226,RECADD          STORE LOOP DATA                  12  09378  D 00226 10298 T
2663                 CS     299                CLEAR CNTL FLD                    6  09390  / 00299
2664                 ZA     ADDR4,X1C          LOAD IX IO                       11  09396  N 10613 00074
2665                 SW     DATAFD             CLEAR                             6  09407  , 11000
2666      CLEAN7     CS     08X10                   THE                          6  09413  / 00000
2667                 SBR    X1C                        DATA                      7  09419  G 00074 8
2668                 BW     CLEAN7,DATAFD                   FIELD               12  09426  V 09413 11000 1
2669                 MLCB   XCTL1-1,LOOP&1      SET MODE & CHANNEL               12  09438  D 10275 01014 L
2670                 MLCS   XCTL1,LOOP&3        SET SPECIFIC OPER                12  09450  D 10276 01016 3
2671                 MLCS   XCTL1&1,LOOP&9      SET MODIFIER                     12  09462  D 10277 01022 3
2672                 ZA     NOFCHR,X8          LOAD IND REG 8                   11  09474  M 10291 00064
2673                 ZA     NOFREC,WORK1       ADD NO. OF RECORDS               11  09485  M 10287 10301
2674                 A      &6&,NOFCHR         INCREASE CHAR COUNT              11  09496  A 10718 10291
2675                 M      NOFCHR,WORK2       RECORDS X CHARS                  11  09507  @ 10291 10306
2676                 ZA     WORK2,X9           LOAD RESULT INTO IX9             11  09518  M 10306 00069
2677                 MLCS   NOFCHR&1,DATAFD                                     12  09529  D 10292 11000 3
2678                 MLCS   BOSIO,LOOP&1C       ALTER B-O-S-I-O OP               12  09541  D 10278 01023 3
2679                 MLCA   FA2,FILE&7                                          12  09553  D 10284 10998 T
2680                 S      WORK2              RESET WORK 2                      6  09565  S 10306
2681                 BCE    LOOP,LOOP&3,0      BRCH IF SEEK OP                  12  09571  B 01013 01016 0
2682                 MLCS   LOOP&1,POSIT&1                                      12  09583  D 01014 09620 3
2683                 MLCS   LOOP&1C,POSIT&1D                                    12  09595  D 01023 09629 3
2684                 MLCS   LOOP&1C,POSIT&17                                    12  09607  D 01023 09636 3
2685      POSIT      SD     1,FILE             POSITION ACCESS                  10  09619  M &FD 10991 R
2686                 BCB1   *-16                                                7  09629  R 09619 2
2687                 BAI    *&1                                                7  09636  R 09643 N
2688                 MLCS   LOOP&3,*&12        MOVE THE OP CODE                 12  09643  D 01016 09666 3
2689                 BCE    SRC,SPECCD,        IS THE OP CODE 1                 12  09655  B 09697 10311
2690                 BCE    TRC                IS THE OP CODE 2                  6  09667  B 09756
```

PROGRAM	LABEL	OPCODE	OPERAND		CY	ADDRS	INSTRUCTION		
2691		BCE	NWO	IS THE OP CODE 5	6	09673	B 09838		
2692		BCE	TWA	IS THE OP CODE 6	6	09679	B 09956		
2693		BCE	SEVO	IS THE OP CODE 7	6	09685	B 10056		
2694		H	PROGTL	SPECIFIC OP INCORECT	6	09691	. 02263		
2695	SRO	MLCA	RECADD,FILEC7	LOAD REC ADDR	12	09697	D 10298	10998	T
2696		SW	DATAFD&X8	LOAD	6	09709	. 11.+8		
2697		MRCW	DATAFD,DATAFD&1	DATA	12	09715	D 11000	11001	M
2698		MLCWS	&M8,DATAFD&X8	FIELD	12	09727	D 10617	11.+8	7
2699		H	LOOP		7	09739	J 01013		
2700	TWO	ZA	NOFREC,WORK1	ADD NO. OF RECORDS	11	09746	A 10287	10301	
2701		S	863,NOFCHR	RESET NOFCHR COUNT	11	09757	S 10718	10291	
2702		S	WORK2		6	09768	S 10306		
2703		M	NOFCHR,WORK2	RECORDS X CHARS	11	09774	M 10291	10306	
2704		ZA	WORK2,X9	LOAD RESULT INTO IX9	11	09785	A 10306	00069	
2705		SW	DATAFD&X9	THE	6	09796	. 11.+0		
2706		MRCW	DATAFD,DATAFD&1	DATA	12	09802	D 11000	11001	M
2707		MLCWS	&M8,DATAFD&X9	FIELD	12	09814	D 10617	11.+0	7
2708		B	LOOP		7	09826	J 01013		
2709	MAC	A	&28,X9		11	09833	A 10632	00069	
2710		ZA	&0C0008,X8	RESET IND REG 8	11	09844	A 10651	00064	
2711		SW	DATAFD&X9	LOAD	6	09855	. 11.+0		
2712		MRCW	DATAFD,DATAFD&1	DATA	12	09861	D 11000	11001	M
2713		MLCWS	&M8,DATAFD&X9	FIELD	12	09873	D 10617	11.+0	7
2714		PRC	MA2-1,DATAFD	LOAD MA2 ADDR	12	09885	D 10283	11000	#
2715	LOADCR	MLCA	RECADD,DATAFD&7&X8	LOAD	12	09897	D 10298	11.+07	T
2716		S	&18,NOFREC	THE	11	09909	S 10619	10287	
2717		BZ	LOOP	RECORD	7	09920	J 01013	V	
2718		A	NOFCHR,X8	ADDR	11	09927	A 10291	00064	
2719		A	&18,RECADD	IN	11	09938	A 10619	10298	
2720		B	LOADCR	THE DATA FLD	7	09949	J 09897		
2721	TWA	SW	DATAFD&X9	LOAD	6	09956	. 11.+0		
2722		MRCW	DATAFD,DATAFD&1	DATA	12	09962	D 11000	11001	M
2723		MLCWS	&M8,DATAFD&X9	FIELD	12	09974	D 10617	11.+0	7
2724		ZA	&0C0008,X8	LOAD	11	09986	A 10651	00064	
2725	LOTADD	MLCA	RECADD,DATAFD&5&X8	THE	12	09997	D 10298	11.+05	T
2726		S	&18,NOFREC	RECORD	11	10009	S 10619	10287	
2727		BZ	LOOP	ADDRESS	7	10020	J 01013	V	

PREPARE 1 INST LOOP & DATA FIELD

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2728		A	NOFCHR,X8	INTO	11	10027	A 10291 00064
2729		A	@1@,RECADD	THE	11	10038	A 10619 10298
2730		B	LOCADD	DATA FIELD	7	10049	J 09997
2731	WFC	SW	DATAFD&700C	LOAD DATA	6	10056	, 18000
2732		MRC	DATAFD,DATAFD&1	FIELD	12	10062	D 11000 11001 #
2733		MLCA	HAAREA,DATAFD&32	LOAD HA1 AREA OF FORMAT	12	10074	D 10353 11032 T
2734		S	@6@,NOFCHR	RESET NO. OF CHAR	11	10086	S 10718 10291
2735		ZA	NOFREC,WORK1	DETERMINE THE END	11	10097	COM 10287 10301
2736		A	@1@,NOFCHR&1	ADDRESS AREAS	11	10108	A 10619 10292
2737		SW	DATAFD&42		6	10119	, 11042
2738		MLCS	NOFCHR&1,DATAFD&56	LOAD THE LONG GAPS	12	10125	D 10292 11056 3
2739		MLCB	DATAFD&56,DATAFD&55	OF THE FORMAT FIELD	12	10137	D 11056 11055 L
2740		MLCS	DATAFD&56,DATAFD&04	LOAD THW SHORT GAPS	12	10149	D 11056 11084 3
2741		MLCS	DATAFD&56,DATAFD&70	OF THE FORMAT FIELD	12	10161	D 11056 11070 3
2742		A	@5C@,NOFCHR	DETERMINE SIZE OF RECS IN FORMAT	11	10173	AQM 10720 10291
2743		ZA	NOFCHR,X9	THE FORMAT	11	10184	M 10291 00069
2744	LOOFOR	MLCA	DATAFD&84,DATAFD&84&X9	LOAD RECS IN FORMAT	12	10195	D 11084 11'Y4 T
2745		S	@1@,NOFREC	REDUCE REC COUNT BY1	11	10207	S 10619 10287
2746		BZ	*&19		7	10218	J 10243 V
2747		A	NOFCHR,X9		11	10225	A 10291 00069
2748		B	LOOFOR		7	10236	J 10195
2749		MLCS	NOFCHR&1,DATAFD&42&X9	LOAD LAST GAP	12	10243	D 10292 11'U2 3
2750		MLCWS	@MG@,DATAFD&43&X9	SET TERMINATING WMGM	12	10255	D 10617 11'U3 7
2751		B	LOOP		7	10267	J 01013
2752							

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2754		***	CONSTANTS ***			
2755	LRDATA	DCW	@ @	1	10274	
2756		DCW	@ @	1	10275	
2757	XCTL1	DCW	@ @	1	10276	
2758		DC	@ @	1	10277	
2759	BOSIO	DCW	B @	1	10278	
2760	TKHD	DCW	@ @	4	10282	
2761	HA2	DC	@ @	2	10284	
2762	ACFREC	DCW	@ @	3	10287	
2763	ADFCHR	DCW	@ @	4	10291	
2764		DC	@ @	1	10292	
2765	RECADD	DCW	@ @	6	10298	
2766	WORK1	DCW	@0C0@	3	10301	
2767	WORK2	DC	@0C000@	5	10306	
2768	SPECCD	DCW	@76521@	5	10311	
2769	ADR1	DCW	DATAFD&245	5	10316	11245
2770	TOTIME	DCW	@0C00@	4	10320	
2771	HAAREA	DCW	@4444443333333333334333333333333340	33	10353	
2772	GAP6	DCW	@22222222222222211111111111112111111111111120,G	43	10396	
2773	HADP	DC	@8E@	2	10398	
2774	ADDR1	DCW	@ACDRO1@	6	10405	
2775		DC	@***---&&& @	10	10415	
2776	ADDR2	DCW	@ACDRO212488421 @	16	10416	
2777	ADDR3	DCW	@ACDRO3.¤TM$*B,L-/,%SMB#@.TMMABCDEFGHI'JKLMNOPQR*ST@	50	10432	
2778		DC	@UVWXYZ035679 @,G	16	10497	
2779	GAP8	DCW	@4444444444444443333333333333433333333333340,G	43	10541	
2780	CVLCNT	DCW	@0C0@	3	10545	
2781	DELAY	DCW	@0C0C0@	5	10550	
2782	COUNT	DCW	@0C@	2	10552	
2783	CETKHD	DCW	@9%2088@,G	6	10558	
2784	CODE3	DCW	@%R1@	3	10562	
2785		DCW	@¤X2@	3	10565	
2786		DCW	@M33@	3	10568	
2787		DCW	@.14@	3	10571	
2788	CCODE3	DCW	@@R1@	3	10574	
2789		DCW	@*X2@	3	10577	
2790		DCW	@33	3	10580	

CONSTANTS

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2791		DCW	@#14@	3	10583	
2792	BLANK	DCW	@ @,G	4	10584	
2793	INTRET	B	N17XIT	7	10589	J 07517
2794		DC	@ @	1	10596	
2795	AVATAB	DCW	@ @	2	10598	
2796		DC	@ @	1	10599	
2797		DCW	@ @	2	10601	
2798		DC	@ @	1	10602	
2799		DCW	@ @	2	10604	
2800		DC	@ @	1	10605	
2801		DCW	@ @	2	10607	
2802		DCW	@M@	1	10608	
2803	ADDR4	DCW	DATAFD&7000	5	10613	18000
2804		LTORG	*		10614	
2804			@N@	1	10614	
2804			@#@	1	10615	
2804			@L@	1	10616	
2804			@M@	1	10617	
2804			@ @	1	10618	
2804			@1@	1	10619	
2804			@00209@	5	10624	
2804			@3@	1	10625	
2804			@7@	1	10626	
2804			@0C237@	5	10631	
2804			@2@	1	10632	
2804			@09995@	5	10637	
2804			@01@	2	10639	
2804			@0CC01@	5	10644	
2804			@51@	2	10646	
2804			@0C000@	5	10651	
2804			@0C@	2	10653	
2804			@317@	3	10656	
2804			@01332@	5	10661	
2804			N18	5	10666	07524
2804			@CC00@	4	10670	
2804			@9#20@	4	10674	
2804			@4@	1	10675	

PGLIN	LABBL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
28C4			@31@	2	10677	
28C4			@9680@	4	10681	
28C4			@9930@	4	10685	
28C4			@300@	3	10688	
28C4			N11	5	10693	06409
28C4			@Y@	1	10694	
28C4			@59@	2	10696	
28C4			@57@	2	10698	
28C4			N07	5	10703	05477
28C4			N01	5	10708	04289
28C4			@01331@	5	10713	
28C4			@1291@	4	10717	
28C4			@6@	1	10718	
28C4			@5C@	2	10720	
28C5		ORG	10991		10991	
28C6	FILE	DCW	@000000880,G	8	10991	
28C7	DATAFD	DC	@ @	1	11000	
28C8		DS	300		11300	
28C9		LOAD				
2810		END	2000			J02000

END OF ASSEMBLY

6.24.00.0 7631 ELECTRONIC TEST DESCRIPTION

Beginning with a reset of the machine, the program starts with as simple an operation as possible and builds upward to more complex operations and tests. The program runs through 27 test routines in either the manual or automatic mode. Although both modes require manual intervention, the automatic requires far less than the manual mode, but the manual mode is a more thorough test. The program uses any 1302 access and module selected, all other access and modules are bypassed and are set inoperative. Any 7631 available on any channel may be tested starting with channel 1 through 4.

The program does not require that the home addresses be present or correct, and data on the customer's tracks is not disturbed.

6.24.01.1 OPERATING PROCEDURE

The standard procedures outlined in the package write-up apply to this program. In addition, the following procedures are used to run this program.

01.1 SWITCH SETTINGS PREVIOUS TO RUNNING PROGRAM

A. All 1302 modules and access are set operative (all channels being tested).

B. Check control switch to reset and restart (1410 console).

01.2 SPECIAL REQUESTS

A. "Tst Chl x, Enter 2 Digit Acc & Mod Addr to be used, Enter 99 if no test on this channel"
If the CE wants the 7631 tested on the channel indicated, he enters the access and module to be used. If the 7631 is not to be tested, he enters 99.

B. "HAO, CE WRT, CE-HAO, On for this Chl 7631. WRT FMT ON for SLTD Acc & Mod, SEL MODE"
This tells the CE to turn on the switches required and requests that the mode be selected. If the CE enters a "1" manual mode is run; if a 1 is entered, automatic mode is run.

6.24.01.0 OPERATING PROCEDURE (continued)

C. "COMP RESET, CHK 7631"

The CE presses Computer Reset, checks the lights on the 7631 to insure that it is reset, and then presses Start.

D. "ACC TO CYL 000" (Manual Mode only)

The CE manually sets the access on 1301 module 0 to cylinder 000. Press Start.

E. "ACC TO CYL 110" (Manual Mode only)

The CE manually sets the access to cylinder 110. Press Start.

F. "ACC TO CYL 194" (Manual Mode only)

The CE sets the access to cylinder 194. Press Start.

G. "ACC TO CYL 250"

The CE checks the access to insure it has positioned itself properly at cylinder 250, then presses Start.

H. "# OF SPARE HEADS"

The CE enters the number of spare heads available for writing on alternate surfaces (should enter 2, 4, or 6).

I. "CE-HAO OFF"

Ce turns off CE-HAO switch and presses Start.

J. "CYO"

CE enters 1 if CYOafeature is available.

K. "MOD 3"

CE enters 1 if 7631 is a Model III.

L. "HAO & WRT FMT SWS OFF" (manual mode only)

CE turns off HAO and write format switches on 7631 being tested.

6.24.01.1 OPERATING PROCEDURE (continued)

L. "WRITE INHIBIT AND HAO SWS ON" (Manual mode only)

CE turns on write inhibit and HAO switches on 7631 being tested.

M. "WRT INHIBIT OFF, HAO & CE-HAO SWS ON"

CE turns off write inhibit, turns on HAO and CE-HAO switches on 7631 being tested.

N. "PASS, SWS OFF"

When test is complete, this reminds the CE to turn off 7631 switches before continuing.

01.3 SPECIAL TAD'S

There is one special TAD for this program (memory location 01005). This TAD is set when the mode is selected; if it is set to 1, manual mode is run, if it is set to 1 automatic mode is run. This TAD is set to 1 when the program is loaded.

01.4 STANDARD OPTIONS

Two of the standard options are not available with this program, they are:

A. Alter Routine Sequence - Code 3

B. One Instruction Loop - Code 5

01.5 MANUAL MODE

When running in the manual mode, the following tests are run which are not run in the automatic mode.

A. Test 7631 Track Register

Routines N06, N07, and N08

B. Test HAO, Write Format, and Write Inhibit Switches

Routine N24

01.6 SUMMARY TYPEOUT

The summary of errors typeout is not available with this program.

6.24.02.0 OPERATING HINTS

02.1 SELECTING MANUAL MODE (ALTER SPECIAL TAD)

If the mode selected when the program is first loaded must be changed, use program option code 2 (alter memory) to change memory location 01005 to a 1 or $\overline{1}$.

02.2 LOOPING ROUTINES

Certain routines make requests during their operation for switch settings. These requests must be honored for valid operation.

6.24.03.0 PROGRAM STOPS

03.1 ERROR STOPS

None

03.2 NORMAL STOPS

Memory Location	Reason
03567	Wait for CE to press Computer Reset and Start.
04685	Wait for CE to position ACC at cycle 000 (manual mode only).
04829	Wait for CE to position ACC at cycle 110 (manual mode only)
04973	Wait for CE to position ACC at cycle 194 (manual mode only)
05153	Wait for CE to insure ACC is at cycle 250.
07360	Wait for CE to turn off CE-HAO (manual mode)
08867	Turn off write format and HAO switches (manual mode)
09070	Turn on write inhibit and HAO switches (manual mode)
09283	Turn off write inhibit, turn on CE-HAO
09539	Reset all switches

6.24.04.0 TYPEOUTS (OTHER THAN REQUESTS AND STANDARD TYPEOUTS)

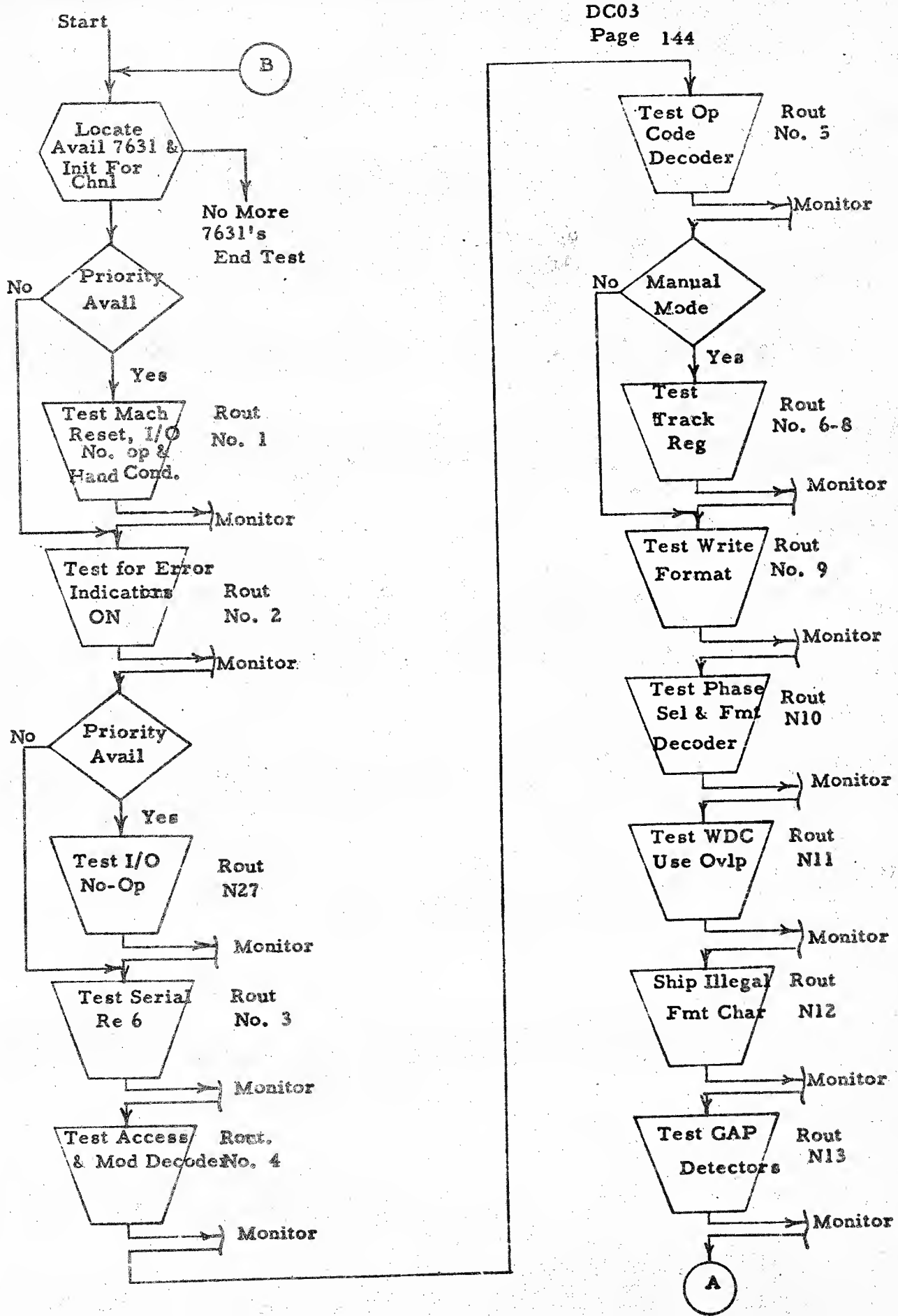
04.2 "TST CH0"

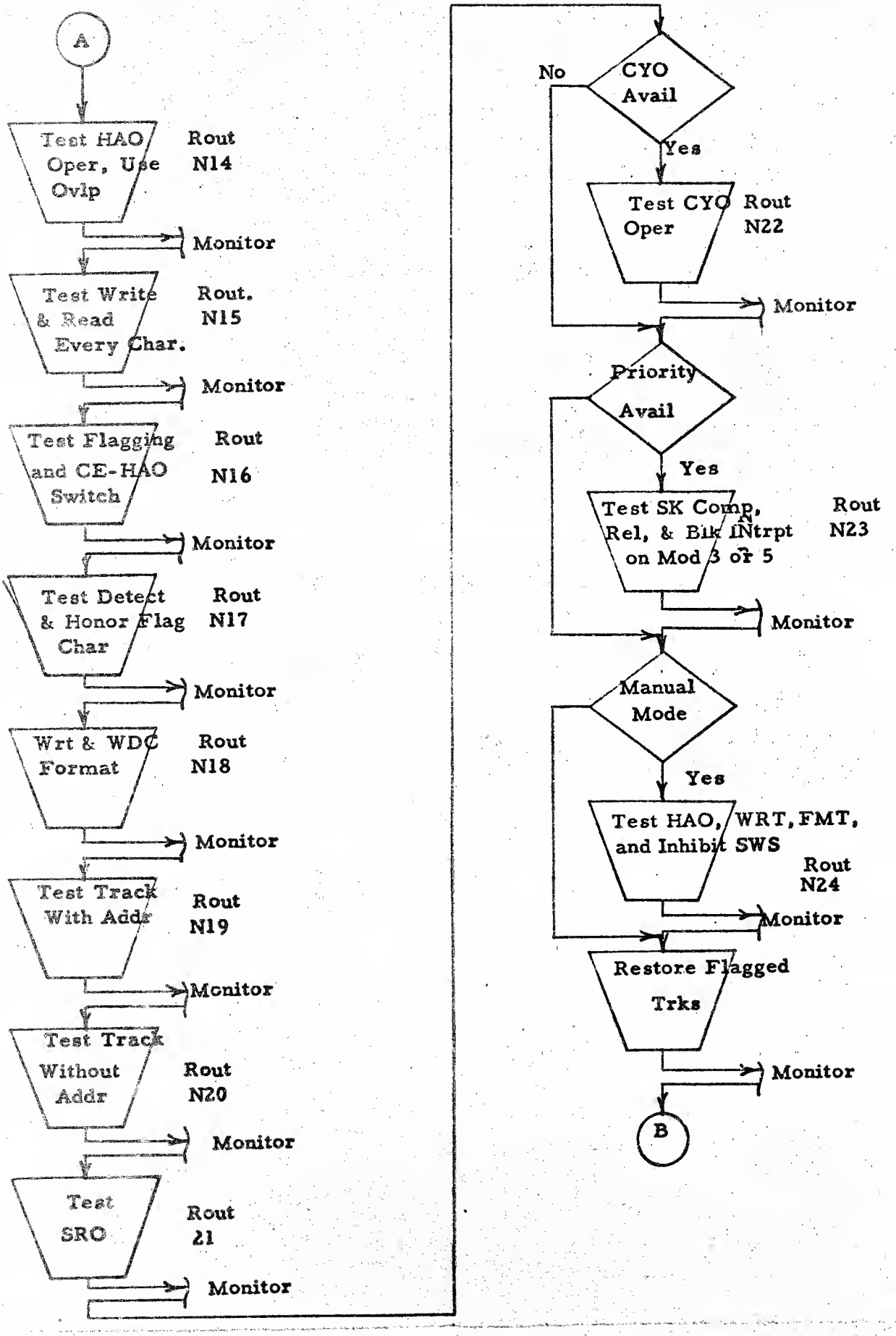
This tells the CE which channel is being tested.

04.2 Following the standard error message a third line of data, pertinent to the error, will be given with some errors. This will be the setting of the E or B register after the file op or the file address being used. Refer to the individual test routines for details.

6.24.05.0 FLOW CHART

The following flow chart is designed to give a general picture of the test routine's relationship to one another.


Start
B
Locate Avail 7631 & Init For Chnl
No More 7631's End Test
No
Priority Avail
Yes
Test Mach Reset, I/O No. op & Hand Cond.
Rout No. 1
Monitor
Test for Error Indications ON
Rout No. 2
Monitor
No
Priority Avail
Yes
Test I/O No-Op
Rout N27
Monitor
Test Serial Re 6
Rout No. 3
Monitor
Test Access & Mod Decoder
Rout. No. 4
Monitor
Test Op Code Decoder
Rout No. 5
Monitor
No
Manual Mode
Yes
Test Track Reg
Rout No. 6-8
Monitor
Test Write Format
Rout No. 9
Monitor
Test Phase Sel & Fmt Decoder
Rout N10
Monitor
Test WDC Use Ovlp
Rout N11
Monitor
Ship Illegal Fmt Char
Rout N12
Monitor
Test GAP Detectors
Rout N13
Monitor
A


A
Test HAO Oper, Use Ovlp
Rout N14
Monitor
Test Write & Read Every Char.
Rout. N15
Monitor
Test Flagging and CE-HAO Switch
Rout N16
Monitor
Test Detect & Honor Flag Char
Rout N17
Monitor
Wrt & WDC Format
Rout N18
Monitor
Test Track With Addr
Rout N19
Monitor
Test Track Without Addr
Rout N20
Monitor
Test SRO
Rout 21
Monitor
No
CYO Avail
Yes
Test CYO Oper
Rout N22
Monitor
Priority Avail
Yes
Test SK Comp, Rel, & Blk INtrpt on Mod 3 or 5
Rout N23
Monitor
Manual Mode
Yes
Test HAO, WRT, FMT, and Inhibit SWS
Rout N24
Monitor
Restore Flagged Trks
Monitor
B

6.24.06.0 ROUTINE/ERROR INDEX DC03

This index should be used to locate routines and errors in the program listing.

6.24.06.0 ROUTINE/ERROR INDEX DC03 (continued)

NOTES

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1002		ORG	1000		01000	
1003	TAD0	DCW	@ @	1	01000	
1004	TAD1	DCW	@ @	1	01001	
1005	TAD2	DCW	@ @	1	01002	
1006	TAD3	DCW	@ @	1	01003	
1007						
1008		DEFINE SPECIAL TADS				
1009						
1010	SPTAD0	DCW	@ @	1	01004	
1011	SPTAD1	DCW	@ @	1	01005	
1012	SPTAD2		@ @	1	01006	
1013	SPTAD3		@ @	1	01007	
1014	SPTAD4		@ @	1	01008	
1015	SPTAD5		@ @	1	01009	
1016	SPTAD6		@ @	1	01010	
1017	SPTAD7		@ @	1	01011	
1018	SPTAD8		@ @	1	01012	
1019	SPTAD9		@ @	1	01013	

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1021                       *** I/O DICOST PROGRAM ***
1022                   *** ONE INSTRUCTION LOOP ROUTINE ***
1023          WHEN THE CE SELECTS A ONE INSTRUCTION LOOP THE I/O INSTRUCTION
1024        IN THIS ROUTINE IS ALTERED AND THE LOOP IS ENTERED.NOTE THAT THE
1025        BRANCH ON INQUIRY INSTRUCTION IS THE ONLY EXIT FROM THE LOOP.
1026      LOOP      MU      %11,0,R          I/O INST BEING LUP D      10  01014  M %11 00000 R
1027                BAI     *&1                                         7  01024  R 01031 G M
1028                BNQ     PRGCTL           BRCH ON INQ TO PRGCL       7  01031  J 02273 Q
1029                B       LOOP             CONTINUE TO LOOP           7  01038  J 01014
1030                H                                                   1  01045  .
1031
```

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1033                   *** I/O DICOST PROGRAM ***
1034                *** CHANNEL ALTER ROUTINE ***
1035          THIS ROUTINE ALTERS ALL I/O INSTRUCTIONS,BRANCH-ON-STATUS-
1036         INDICATOR-ON INSTRUCTIONS,AND BRANCH ON CHANNEL OVERLAP IN PRO-
1037         CESS INSTRUCTIONS ACCORDING TO THE CHANNEL INDICATED.THIS IS DONE
1038         BY SCANNING A DEFINED AREA OF MEMORY AND ALTERING THESE INSTRUC-
1039         TIONS.
1040
1041     CHALTR    SBR    X5          STORE ADDR                    7  01046  G 00049 B
1042               MLCA   9&X5,X7     LOAD IX6 & IX7               12  01053  D 00#*9 00059 I
1043     SCAN      SCNLA  0&X6,0&X6   SCAN FOR WM                  12  01065  D 00#.0 00#.0 S B
1044               SAR    X6          STORE ADDR OF OPER            7  01077  G 00054 A
1045               C      X6,X7       HAS ALL OF FLD BEEN          11  01084  C 00054 00059
1046               BH     13&X5       SEARCHED IF SO BRCH           7  01095  J 00#/3 U
1047               MLCS   1&X6,*&12   STORE OP CODE                 12  01102  D 00#.1 01125 3
1048               BCE    MLORU,CODES, IS OP CODE M                12  01114  B 01150 02586
1049               BCE                IS OP CODE L                  1  01126  B
1050               BCE                IS OP CODE C                  1  01127  B
1051               BCE    RX3OR1      IS OP CODE R                  6  01128  B 01169
1052               BCE                IS OP CODE X                  1  01134  B
1053               BCE                IS OP CODE 3                  1  01135  B
1054               BCE                IS OP CODE 1                  1  01136  B
1055               BCE    JAY         IS OP CODE J                  6  01137  B 01188
1056               B      SCAN        GO FIND NEXT OPER             7  01143  J 01065
1057     MLORU     MLCS   10&X5,2&X6  CHEANGE CH-MODE CHAR          12  01150  D 00#/0 00#.2 3
1058               B      SCAN        GO FIND NEXT OPER             7  01162  J 01065
1059     RX3OR1    MLCS   11&X5,1&X6  CHANGE B-I-S-1-0 OP           12  01169  D 00#/1 00#.1 3
1060               B      SCAN        GO FIND NEXT OPER             7  01181  J 01065
1061     JAY       MLCS   7&X6,*&12   STORE MODIFIER                12  01188  D 00#.7 01211 3
1062               BCE    ONE234,MODS, IS MODIFIER A 1              12  01200  B 01222 02590
1063               BCE                IS MODIFIER A 2               1  01212  B
1064               BCE                IS MODIFIER A 3               1  01213  B
1065               BCE                IS MODIFIER A 4               1  01214  B
1066               B      SCAN        GO FIND NEXT OPER             7  01215  J 01065
1067     ONE234    MLCS   12&X5,7&X6  CHANGE BCL MODIFIER           12  01222  D 00#/2 00#.7 3
1068               B      SCAN        GO FIND NEXT OPER             7  01234  J 01065
1069               H                                                1  01241  .
```

PGLIN LABEL OPCOD OPERAND CT ADDRS INSTRUCTION

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
1071
1072                ORG    1233                                           01233
1073                DCW    @FP6FMLFMTFMC385/2@                        17  01249
1074              DEFINE PROGRAM TITLE
1075                                                    **
1076                ORG    1250                                           01250
1077                DCW    @0C03B@,G                                   5  01254
1078
1079              LOCATE THE SYSTEM & CHANNEL CARDS
1080
1081                ORG    1256                                           01256
1082      SYSTEM    DC     @                                  @       50  01256
1083                       @      @                                    7  01312
1084                ORG    1289                                           01289
1085      CHNL1     DC     @                                  @       50  01289
1086                       @      @                                    7  01345
1087                ORG    1346                                           01346
1088      CHNL2     DC     @                                  @       50  01346
1089                       @      @                                    7  01402
1090                ORG    1403                                           01403
1091      CHNL3     DC     @                                  @       50  01403
1092                       @      @                                    7  01459
1093                ORG    1460                                           01460
1094      CHNL4     DC     @                                  @       50  01460
1095                       @      @                                    7  01516
1096
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1098				*** I/O DICOST PROGRAM ***			
1099				*** TYPE AND REQUEST FOR INTERVENTION ***			
1100				THIS RCUTINE IS USED TO TYPE ALL MESSAGES AND REQUESTS FOR			
1101				MANUAL INTERVENTION.THE ROUTINE WILL TYPE A MESSAGE FRCM A COMMON			
1102				DATA FIELD,OR THE MESSAGE MAY BE LOCATED IMMEDIATELY AFTER THE			
1103				BRANCH INSTRUCTION TO THIS ROUTINE.IF A REPLY IS REQUIRED A READ			
1104				CONSOLE PRINTER OPERATION IS ISSUED.THIS ROUTINE IS USED TO TYPE			
1105				ALL MESSAGES IN THIS PROGRAM.			
1106							
1107	TYMES	SBR	TYPXIT&5	STORE RETURN ADDR	7	01517	G 01591 B
1108	TYPE	WCP	201	TYPE MESSAGE	10	01524	M %TO 00201 M
1109		BEX1	TYPE,S,M	BRCH ON ANY BUT WLR	7	01534	R 01524 S,M
1110		BA1	*&1		7	01541	R 01548 G,M
1111	SW11	NCPWM			1	01548	N
1112	LAB60	RCP	0	READ CONSOLE PRINTER	10	01549	M %TO 00000 R
1113		BEX1	*-16,S,M	BRCH ON ANY BUT WLR	7	01559	R 01549 S,M
1114		BA1	*&1		7	01566	R 01573 G,M
1115		CW	SW11&1	TURN OFF SWITCH 11	6	01573	¤ 01549
1116		CS	33C	CLEAR PRINT AREA	6	01579	/ 00330
1117		CS			1	01585	/
1118	TYPXIT	B	0	RETURN TO DICOST	7	01586	J 00000
1119	TYP1	SBR	X1	STORE ADDR OF MESG	7	01593	G 00029 B
1120		B	*&14		7	01600	J 01620
1121	TYP2	SBR	X1	STORE ADDR OF MESG	7	01607	G 00029 B
1122		SW	REPLY&1	TURN ON REPLY SW	6	01614	, 01652
1123		WCP	0&X1	TYPE MESSAGE	10	01620	M %TO 000#0 M
1124		SBR	X5	SAVE ADDR	7	01630	G 00049 B
1125		BEX1	*-23,S,M	BRCH ON ANY BUT WLR	7	01637	R 01620 S,M
1126		BA1	*&1		7	01644	R 01651 G,M
1127	REPLY	NCPWM		BRCH	1	01651	N
1128		B	RDCON	IF REPLY REQUIRED	7	01652	J 01666
1129		B	0&X5	RETURN	7	01659	J 00##0
1130	RDCON	RCP	0&X5	REPLY TO MESSAGE	10	01666	M %TO 00##0 M
1131		SBR	X1	SAVE ADDR	7	01676	G 00029 B
1132		BEX1	*-23,S,M	BRCH ON ANY BUT WLR	7	01683	R 01666 S,M
1133		BA1	*&1		7	01690	R 01697 G,M
1134		CW	REPLY&1		6	01697	¤ 01652

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1135                B      0&X1              RETURN          7  01703  J 000*0
1136      DATA      DCW    @          @                     12  01710
1137                BCE    *&13,1264,1       BRCH IF PRIORITY AVAIL  12  01722  B 01746 01264 1
1138                MLCWS  @N@,MONITR&7      ALTER PRIORITY INST TO NO-OP  12  01734  D 10484 02108 7
1139                MLCWS  @N@,PASS1         RESET 1ST PASS BRCH  12  01746  D 10484 01944 7
1140                MRCWG  *&9,1231                          12  01758  D 01778 01231 L
1141                B      PASS1&7                           7  01770  J 01951
1142                H                                        1  01777  .
1143                DC     @'73@                             3  01780
1144                DCW    @J@                               1  01781
1145                DC     SCAN                              5  01786  01065
1146                DC     @ @                               1  01787
1147                DCW    @.@,G                             1  01788
1148              *** ERROR TABLES THESE ARE USED FOR ERROR ***
1149              *** SUMMARIES AND ERROR INDENTIFICATION ***
1150
1151                ORG    *&X00                                01800
1152                ORG    *&1                                  01801
1153      STPTAB    DCW    @L@                               1  01801
1154       E1       DC     @ @                               1  01802
1155       E2               @ @                               1  01803
1156       E3               @ @                               1  01804
1157       E4               @ @                               1  01805
1158       E5               @ @                               1  01806
1159       E6               @ @                               1  01807
1160       E7               @ @                               1  01808
1161       E8               @ @                               1  01809
1162       E9               @ @                               1  01810
1163       E10              @ @                               1  01811
1164       E11              @ @                               1  01812
1165       E12              @ @                               1  01813
1166       E13              @ @                               1  01814
1167       E14              @ @                               1  01815
1168       E15      DC      @ @                               1  01816
1169       E16              @ @                               1  01817
1170       E17              @ @                               1  01818
1171       E18              @ @                               1  01819
1172       E19              @ @                               1  01820
```

PGLIN	LABEL	I/O DICOST TYPE OPCOO	OPERAND	CT	ADDRS	INSTRUCTION
1173	E20		a a	1	01821	
1174	E21		a a	1	01822	
1175	E22		a a	1	01823	
1176	E23		a a	1	01824	
1177	E24		a a	1	01825	
1178	E25	DC	a a	1	01826	
1179	E26	DC	a a	1	01827	
1180	E27		a a	1	01828	
1181	E28		a a	1	01829	
1182	E29		a a	1	01830	
1183	E30		a a	1	01831	
1184	E31		a a	1	01832	
1185	E32		a a	1	01833	
1186	E33		a a	1	01834	
1187	E34		a a	1	01835	
1188	E35		a a	1	01836	
1189	E36		a a	1	01837	
1190	E37		a a	1	01838	
1191	E38		a a	1	01839	
1192	E39		a a	1	01840	
1193	E40		a a	1	01841	
1194	E41		a a	1	01842	
1195	E42		a a	1	01843	
1196	E43		a a	1	01844	
1197	E44		a a	1	01845	
1198	E45		a a	1	01846	
1199	E46		a a	1	01847	
1200	E47		a a	1	01848	
1201	E48		a a	1	01849	
1202	E49		a a	1	01850	
1203	E50		a a	1	01851	
1204	E51	DC	a a	1	01852	
1205	E52		a a	1	01853	
1206	E53		a a	1	01854	
1207	E54		a a	1	01855	
1208	E55		a a	1	01856	
1209	E56		a a	1	01857	
1210	ERRTAB	DC	a*a	1	01858	

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PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1211		DC	@ &	1	01859	
1212						

```
PGLIN     LABEL     OPCOD  OPERAND                        CT  AODRS  INSTRUCTION
1214                ***  INITIALIZE ROUTINE FOR THE DICOST PROGRAM ***
1215      INITLE    WCP    1250                PRINT TITLE 10  01860  M %TO 01250 H
1216                BCB1   *-16                            7  01870  R 01860 2
1217                BA1    *&1                             7  01877  R 01884 M
1218                CS     99                  RESET IND REG S 6  01884  / 00099
1219                SW     25                  SET WM IN IND REG 1 6  01890  , 00025
1220                MLCS   @*@,100             PREPARE TO LOAD 2-15 12  01896  0 10485 00100 3
1221                MRWR   25,30               LOAD IND REG 2-15 12  01908  0 00025 00030 &
1222                MRCWG  RESUME,1            MOVE RESET PROCEDURE 12  01920  0 02015 00001 L
1223                MRCWG  INTR,1C1            MOVE INTERUPT PROC 12  01932  0 02007 00101 L
1224      PASS1     B      0A1A&12             GO DO MORE INITIALIZING 7  01944  J 01722
1225                CW     LPRT,SW11&1                    11  01951  ¤ 02598 01549
1226                CS     E56                 CLEAR AND RESET 6  01962  / 01857
1227                MLCWS  @L@,STPTAB           ERROR TABLE 12  01968  D 10486 01801 7
1228                B      START               GO TO ROUTINE INIT. 7  01980  J 03400
1229
1230                H                                      1  01987  .
1231                ORG    2000                           02000
1232                B      INITLE                         7  02000  J 01860
1233                ***  RESET & INTERUPT ROUTINES,THESE ROUTINES ***
1234                ***  ARE MOVED TO LOCATIONS 1 & 101
1235      INTR      BNQ    PRGCTL              RETURN TO PROG CNTRL 7  02007  J 02273 Q
1236                DCW    @M@                            1  02014
1237      RESUME    B      CKLUP                          7  02015  J 02023
1238                DCW    @M@                            1  02022
1239      CKLUP     BW     MONITR,LPRT         CHECK FOR LOOP ROUT 12  02023  V 02101 02598 1
1240                BW     LOOP,LPINST         CHECK INST LOOP SW 12  02035  V 01014 02599 1
1241                CW     SW11&1,REPLY&1      CLEAR TYPE SWITCHES 11  02047  ¤ 01549 01652
1242                CW     EXTRA&1                        6  02058  ¤ 03005
1243                CS     E56                 CLEAR ERROR TABLE 6  02064  / 01857
1244                MLCWS  @L@,STPTAB                     12  02070  0 10486 01801 7
1245                MLNA   X3,X2               LOAD IX 2 12  02082  D 00039 00034 /
1246                B      MONITR&7            GO TO MONITR 7  02094  J 02108
1247
```

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION

1249                  *** I/O DICOST PROGRAM ***
1250                ***       MONITOR ROUTINE       ***
1251          THE MONITOR IS ENTERED AFTER EVERY TEST ROUTINE IS COMPLETED,OR
1252        A STATUS ERROR HAS BEEN DETECTED AND INDICATED.IN THE CASE OF A
1253        STATUS ERROR MONITOR SIMPLY BRANCHES BACK TO THE POINT AT WHICH
1254        THE STATUS ERROR WAS DETECTED.WHEN ENTERED FROM THE END OF A
1255        TEST ROUTINE MONITOR CHECKS TO SEE IF THE CE PRESSED INQUIRY,THE
1256        ROUTINE IS BEING LOOPED,ANY ERRORS OCCURED,ALTER ROUTINE SEQUENCE
1257        IS SELECTED,OR THE NEXT SEQUENCIAL ROUTINE SHOULD BE RUN.
1258
1259     MONITR    SBR    X2               STORE ADDR          7  02101  G 00034 B
1260               BXPA   *&1              EXIT ALERT MODE     7  02108  Y 02115 X
1261               BNQ    PRGCTL           WAS THERE AN INQ    7  02115  J 02273 Q
1262     MCNIT1    BW     O&X3,LPRT        RETURN IF LOOPING RT 12 02122  V 000M0 02598 1
1263     MONIT2    MLCWS  @Ma,224          SET WMGM SHORT MESG 12 02134  D 10487 00224 7
1264               B      ERRCTL                               7  02146  J 02658
1265     MCNIT3    NOP                                         1  02153  N
1266               MLCWA  X2,X3            LOAD IX3            12 02154  D 00034 00039 X
1267               MLCWS  @ @,224          CLEAR WMGM          12 02166  D 10488 00224 7
1268               B      O&X2             GO TO NEXT ROUTINE  7  02178  J 000.0
1269     WHERE2    MLCWS  *-12,224         CLEAR WMGM          12 02185  D 02184 00224 7
1270               BCE    *&8,O&X2,N       BRCH IF ROUT COMP   12 02197  B 02216 000.0 N
1271               B      O&X2             RETURN TO ROUTINE   7  02209  J 000.0
1272               BZN    *&8,1&X2,2       BRCH IF CHAR IS NUMR 12 02216  V 02235 000.1 2
1273               B      O&X2             RETURN TO ROUTINE   7  02228  J 000.0
1274               BZN    *&8,2&X2,2       BRCH IF CHAR IS NUMR 12 02235  V 02254 000.2 2
1275               B      O&X2             RETURN TO ROUTINE   7  02247  J 000.0
1276               BW     MONIT3,3&X2      BRCH IF CHAR HAS WM 12 02254  V 02153 000.3 1
1277               B      O&X2             RETURN TO ROUTINE   7  02266  J 000.0
1278
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1280                    *** I/O DICOST PROGRAM ***
1281                *** PROGRAM CONTROL ***
1282          WHEN THE CE PRESSES INQUIRY TO SELECT A STANDARD PROGRAM OPTION
1283        THIS ROUTINE IS ENTERED.THE CE ENTERS ON THE TYPEWRITER THE
1284        OPTION CODE DESIRED,ALONG WITH THE DATA NEEDED BY THE OPTION.THE
1285        ROUTINE DETERMINES WHICH OPTION HAS BEEN SELECTED AND INITIATES
1286        THE OPTION.
1287
1288    PRGCTL      RCPW   CTLFLD            READ THE CONSOLE PRT             10  02273  L %TO 00201 R
1289                SBR    X1                                                7  02283  G 00029 B
1290                BEXI   PRGCTL,M S       BRCH ON ANY BUT WLR              7  02290  R 02273 S M
1291                SW     CTLFLD&1                                          6  02297  , 00202
1292                BAI    *&1                                               7  02303  R 02310 G M
1293                CW     LPRT,LPINST      TURN OFF LOOP SWS                11  02310  D 02598 02599
1294                MLWS   *,E1             CLEAR WM IN ERROR                12  02321  D 02332 01802 4
1295                MRWR   E1,E2              TABLE                         12  02333  D 01802 01803 %
1296                MLCS   CTLFLD,*&12       MOVE CTL CODE ENTERD             12  02345  D 00201 02368 3
1297                BCE    ENDTST,CTLCOD,    IS CTL CODE BLANK                12  02357  B 09896 02597
1298                BCE    ALTADS            IS CTL CODE 1                     6  02369  B 02412
1299                BCE    ALTMEM            IS CTL CODE 2                     6  02375  B 02435
1300                BCE    LUPRT             IS CTL CODE 4                     6  02381  B 02482
1301                BCE    ONELUP            IS CTL CODE 5                     6  02387  B 02511
1302                BCE    RSTART            IS CTL CODE 6                     6  02393  B 02545
1303                BCE    CONT              IS CTL CODE 7                     6  02399  B 02568
1304                B      PRGCTL                                            7  02405  J 02273
1305    ALTADS      MLCA   CTLFLD&4,1003     MOVE IN NEW TADS                 12  02412  D 00205 01003 T
1306                CS     MONIT1,299        CLEAR OUT CTL FLD                11  02424  / 02122 00299
1307    ALTMEM      MLCA   CTLFLD&5,*&9      MOVE ADDR TO BE ALTR             12  02435  D 00206 02455 T
1308                RCPW   0                 ALTER MEMORY                     10  02447  L %TO 00000 R
1309                BEXI   *-16,M S          CHECK ALL BUT WLR                7  02457  R 02447 S M
1310                BAI    *&1                                               7  02464  R 02471 G M
1311                CS     MONIT1,299        CLEAR THE CNTRL FLD              11  02471  / 02122 00299
1312    LUPRT       SW     LPRT              TURN ON LOOP SWITCH              6  02482  , 02598
1313                MLNA   CTLFLD&5,X2       LOAD IND REG2                    12  02488  D 00206 00034 /
1314                CS     MONIT2,299        CLEAR CNTRL FLD                  11  02500  / 02134 00299
1315    ONELUP      SW     LPINST            TURN ON LOOP INST SW             6  02511  , 02599
1316    LUPINT      NOPWM                    THIS SW IS TURNED ON             1  02517  N
```

```
PGLIN  LABEL    OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1317            B      *&8                 BY ERRCTL   7  02518  J 02532
1318            B      PREP                GO TO PREPARE ROUT   7  02525  J 09984
1319            CW     LUPINT&1            TURN OFF SW   6  02532  ¤ 02518
1320            B      LOOP                          7  02538  J 01014
1321    RSTART  MLNA   CTLFLD&5,X2         LOAD IND REG2  12  02545  D 00206 00034 /
1322            CS     MONIT2,299          CLEAR CNTRL FLD   11  02557  / 02134 00299
1323    CONT    CS     WHERE2,299          CLR CNTL FLD   11  02568  / 02185 00299
1324
1325          I/C DICOST CONSTANTS
1326    CODES   DCW    @J13XRULM@                         8  02586
1327    MODS    DCW    @43210@                            4  02590
1328            DCW    @7@                                1  02591
1329            DC     @6@                                1  02592
1330                   @5@                                1  02593
1331                   @4@                                1  02594
1332                   @2@                                1  02595
1333                   @1@                                1  02596
1334    CTLCOD         @ @                                1  02597
1335    LPRT    DC     @ @                                1  02598
1336    LPINST  DC     @ @                                1  02599
1337    ADDR02  DCW    ERRTAB              ADDR OF ERR TABLE   5  02604  01858
1338    ERR     DCW    @=ERROR@                           6  02610
1339     ACTION DC     @REQ ERROR ACTION@,G              16  02611
1340    ERCODE  DCW    @547P@                             4  02631
1341     SAVIND DCW    @1 2 4 8 A B@,G                   11  02632
1342     STIND  DC     @1 2 4 8 A B@,G                   11  02644
1343     NOERSW DC     @ @                                2  02656
1344
```

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1346                    *** I/O DICOST PROGRAM ***
1347                *** ERROR CONTROL ***
1348          THIS ROUTINE DETERMINES IF ANY STATUS ERRORS OR PROGRAM DETECT-
1349        ED ERRORS HAVE TO BE INDICATED.IF THERE ARE THIS ROUTINE BUILDS
1350        THE ERROR MESSAGE AND HAS IF TYPED OUT.THIS ROUTINE ALSO CHECKS
1351        TAD 1 TO SEE IF A REQUEST FOR ERROR ACTION SHOULD BE MADE.
1352
1353              LOCATE FAILING INST
1354
1355     ERRCTL   MLCA   X2,X5            LOAD IND REG 5          12 02658 D 00034 00049 I
1356              S      @1&,X5                                    11 02670 S 10489 00049
1357              SCNLA  0&X5,0&X5        SCAN THE ROUTINE        12 02681 D 00##0 00##0 S B
1358              SAR    X5               STORE CHAR ADDR          7 02693 G 00049 A
1359              MLCS   1&X5,*&12        MOVE CHAR TO BE CHKD    12 02700 D 00##1 02723 3
1360              BCE    GOTONE,CODES,    IS OP CODE M            12 02712 B 02756 02586
1361              BCE                     IS OP CODE L             1 02724 B
1362              BCE    SHORT1           IS OP CODE U             6 02725 B 02775
1363              C      X3,X5            HAS ROUTINE BEEN        11 02731 C 00039 00049
1364              BL     LOOFLD            SEARCHED                7 02742 J 02799 I
1365              B      ERRCTL&12        GO CONTINUE THE SRCH     7 02749 J 02670
1366     GOTONE   MLCWA  10&X5,LOOP&9     LOAD THE LOOP INST      12 02756 D 00#/0 01023 X
1367              B      LOOFLD                                    7 02768 J 02799
1368     SHORT1   MLCWA  5&X5,LOOP&9      LOAD THE LOOP INST      12 02775 D 00##5 01023 X
1369              MLCS   @N&,LOOP          SET NO-OP FOR SHORT     12 02787 D 10484 01014 3
1370                                     INSTRUCTION
1371     LOOFLD   MLCA   LOOP&9,234       MOVE FAILING OPER       12 02799 D 01023 00234 I
1372              MLNA   X3,223            MOVE ADDR OF ROUT       12 02811 D 00039 00223 /
1373              ZA     ADDR02,X1         LOAD ND REG 1           11 02823 DQMQ 02604 00029
1374              ZA     @002098,X5        LOAD IND REG 5          11 02834 M 10494 00049
1375                  SCAN ERROR TABLE & UPDATA ERROR COUNT
1376     ERSCAN   SCNLA  0&X1,0&X1        SCAN THE ERROR TABLE    12 02845 D 000#0 000#0 S B
1377              SAR    X1               STORE ADDR               7 02857 G 00029 A
1378              BCE    AFTSRH,1&X1,L D  HAS TABLE BEEN COMP.    12 02864 B 02923 000#1 D L
1379              SW     X1-1            DEFINE ERROR             6 02876 , 00028
1380              MLNWA  X1,0&X5          MOVE ERROR CODE NO.     12 02882 D 00029 00##0 V
1381              A      @3&,X5           UPDATE IND REG 5        11 02894 A 10495 00049
1382                                    NINE TIMES
```

```
PGLIN    LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

1383               CW     1&X1,X1-1          CLEAR WM S              11  02905  ¤ 000#1 00028
1384               B      ERSCAN                                      7  02916  J 02845
1385                   LOAD PRINT FIELD WITH ERROR MESG
1386     AFTSRH    BCE    WHERE2,1000,1      BRCH IF BYPASSING ERRORS   12  02923  B 02185 01000 1
1387     ERROSW    NOP                                                1  02935  N
1388               BCE    WHERE2,209         BRCH IF NO ERRORS          12  02936  B 02185 00209
1389               SW     ERROSW&1           RESET ERROR SW              6  02948  , 02936
1390               MLCA   ERR,206            MOVE ERROR                 12  02954  D 02610 00206 T
1391               MLCA   2&X3,ROUTID        MOVE ROUTINE IDENT         12  02966  D 000M2 02995 T
1392               B      TYP1               GO TYPE ROUTINE ID          7  02978  J 01593
1393               DCW    @ROUTINE @                                     8  02992
1394     ROUTID    CC     @   @,G                                        3  02995
1395               B      TYMES                                       7  02997  J 01517
1396                   TYPE ADDITIONAL  ERROR INFORMATION
1397     EXTRA     NOPWM                                              1  03004  N
1398               WCP    DATA               PRINT EXTRA DATA           10  03005  M &TO 01710 W
1399               BCB1   *-16                                        7  03015  R 03005 2
1400               BA1    *&1                                         7  03022  R 03029 M
1401               CW     EXTRA&1                                     6  03029  ¤ 03005
1402     ACT       BCE    *&8,1001,1         LOOP ACTION REQUIRED       12  03035  B 03054 01001 1
1403               B      WHERE2                                      7  03047  J 02185
1404               SW     LUPINT&1           TURN ON SWITCH              6  03054  , 02518
1405               MRCWG  ACTION,201         MOVE ACTION MESG           12  03060  D 02611 00201 L
1406               B      TYMES                                       7  03072  J 01517
1407               B      PROCTL                                      7  03079  J 02273
1408
1409                  *** I/O DICOST PROGRAM ***
1410              *** DETERMINE WHICH STATUS INDICATORS ARE ON ***
1411        THIS ROUTINE DETERMINES WHICH STATUS INDICATORS ARE ON,ON THE
1412         CHANNEL BEING USED.THE INDICATORS FOUND  ON ARE STORED IN THE
1413         PRINT FIELD AND THE PROGRAM BRANCHES TO ERROR CONTROL.
1414     STACHK    SBR    X5                 STORE ADDR IN IND 5         7  03086  G 00049 B
1415               SBR    X2                                             7  03093  G 00034 B
1416               BW     0&X2,LPRT                                  12  03100  V 000.0 02598 1
1417               S      @7@,X5             REDUCE ADDR BY 7           11  03112  S 10496 00049
1418               MLCS   0&X5,LOOP&10                                   12  03123  D 00##0 01024 3
1419               MRCWG  STIND,237          MOVE STATUS CODES          12  03135  D 02644 00237 L
```

```
PGLIN  LABEL   OPCOD  OPERAND                  CT  ADDRS  INSTRUCTION
1420           MLCS   0&X5,NUOPCO  STORE CHNL CODE   12  03147  D 00##0 03177 3
1421           B      CHALTR                         7  03159  J 01046
1422           OCW    CNTERR       HIGH LIMIT        5  03170  03332
1423           CC     NOTRDY       LOW LIMIT         5  03175  03190
1424           DCW    @ @                            1  03176
1425  NUOPCO   CC     @ @                            1  03177
1426           CC     @ @                            1  03178
1427           ZA     @0C237@,X5   LOAD IX 5        11  03179  Q M 10501 00049
1428  NCTRDY   NCP                                   1  03190  N
1429           BNR1   CNTERR       CHECK FOR NCT READY 7  03191  R 03332 1
1430           B      UPIX         GO UPDATE IND REG  7  03198  J 03363
1431  BUSY     NCP                                   1  03205  N
1432           BCB1   CNTERR       CHECK FOR BUSY     7  03206  R 03332 2
1433           B      UPIX         GO UPDATE IND REG  7  03213  J 03363
1434  DATACK   NCP                                   1  03220  N
1435           BER1   CNTERR       CHECK DATA CNK     7  03221  R 03332 4
1436           B      UPIX         GO UPDATE IND REG  7  03228  J 03363
1437  EXTCND   NCP                                   1  03235  N
1438           BEF1   CNTERR       CHECK FOR EXT CCND 7  03236  R 03332 8
1439           B      UPIX         GO UPDATE IND REG  7  03243  J 03363
1440  NCTRNS   NCP                                   1  03250  N
1441           BNT1   CNTERR       CHECK FOR NC TRANS 7  03251  R 03332 S B
1442           B      UPIX         GO UPDATE IND REG  7  03258  J 03363
1443  WLR      NCP                                   1  03265  N
1444           BWL1   CNTERR       CHECK FOR WLR      7  03266  R 03332 -
1445           B      UPIX         GO UPDATE IND REG  7  03273  J 03363
1446           SW     NOTROY&1,BUSY&1  RESET INSTRUCTICNS 11  03280  , 03191 03206
1447           SW     DATACK&1,EXTCND&1               11  03291  , 03221 03236
1448           SW     NOTRNS&1,WLR&1                  11  03302  , 03251 03266
1449           MRCG   237,SAVIND           SAVE IND   12  03313  D 00237 02632 $
1450           B      ERRCTL               RETURN     7  03325  J 02658
1451  CNTERR   SBR    X6                   STORE RETURN ADDR 7  03332  G 00054 8
1452           A      @7@,X6               UPDATE RETURN ADDR 11  03339  A 10496 00054
1453           CW     ERROSW&1             TURN OFF ERROR SW  6  03350  ¤ 02936
1454           B      UPIX&19                         7  03356  J 03382
1455  UPIX     SBR    X6                   STORE RETURN ADDR  7  03363  G 00054 8
1456           MLCS   @ @,0&X5             REMOVE STATUS CHAR 12  03370  D 10488 00##0 3
```

I/O DICOST ERROR CONTROL

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1457		A	a2a,X5	UPDATE IND REG 5	11	03382	A 10502 00049
1458		B	0&X6	RETURN TO PROGRAM	7	03393	J 00+!0

```
PGLIN     LABEL     I/O DICOST SEQUENCE CONTROL                    DC03          PAGE 166
                    OPCOD  OPERAND                                 CT  ADDRS  INSTRUCTION
1460      CTLFLD    ECU    201
1461                PST
```

INITIALIZE FOR DA04

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1463		*** INITIALIZE COUNTERS,SWITCHES,AND INDEX REG ***					
1464		*** SELECT MODE ***					
1465	START	CW	ONE3SW&1,THREE1&1	CLEAR	11	03400	¤ 05555 05650
1466		S	TENCNT	RESET COUNTER	6	03411	S 09991
1467		ZA	@0C00@,X14	RESET IX 14	11	03417	MQM 10506 00094
1468		ZA	@1275@,X15	LOAD IX 15	11	03428	MQM 10510 00099
1469		B	*&13		7	03439	J 03458
1470		MLCA	@30@,CCN2		12	03446	DQM 10512 10141 I
1471		ZA	&N26,X3	LOAD IX 3	11	03458	MQM 10517 00039
1472		B	N26		7	03469	J 09542

```
PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1474
1475                ***  TEST ROUTINE DESCRIPTION  ***
1476                *** RESET 7631,TEST CONTROL TRIGGER & END CP ***
1477          THIS TEST REQUESTS A MACHINE RESET TO RESET ALL LATCHES IN THE
1478         7631.THEN IF PRIORITY IS AVAILABLE AN OVERLAPPED I/O NC-OP IS
1479         ISSUED,FOLLOWING A SHORT DELAY THE OVERLAP IN PROCESS IS TESTED.
1480         IF OVERLAP IN PROCESS IS ON IT INDICATES THAT THE 7631 HAS HUNG
1481         UP AND THE MACHINE IS RESET BY ISSUING AN ILLEGAL INSTRUCTION.IF
1482         THIS HAPPENS ERROR 01 IS INDICATED,INCLUDED IN THE ERROR MESSAGE
1483         WILL BE THE CONTENTS OF THE E REGISTER.SHOWING HOW MANY CHARACTER
1484         WHERE TRANSFERED BEFORE THE 7631 HUNG UP.
1485
1486    NO1         NOP                                                    1  03476  N
1487                CC      @01@                ROUTINE ID                 2  03478
1488                MRCWG   BRCH0,1             MOVE RESET BRCH INST      12  03479  D 10004 00001 D L
1489                B       TYP1                                           7  03491  J 01593
1490                OCW     @CCMP RESET,CHK 7631@,G                       19  03516
1491                H                           WAIT FOR ACTION            1  03518  .                D
1492    RESET1      MRCWG   RESUME,1            RESTORE LOC 1             12  03519  D 02015 00001 D L
1493                BCE     *68,1264,1          BRCH IF PRIORITY AVA      12  03531  B 03550 01264 1
1494    BOTTOM      B       NO1XIT                                         7  03543  J 03685
1495                MRCG    CEADDR,FILE         SET FILE ADDR             12  03550  D 10342 10391 $
1496                MLCS    OVRLAP&X14,*62      MOVE OVER LAP CODE        12  03562  D 10091 03575 3
1497                MU      @FC,FILE,V          I/O NO-OP OVERLAPPED      10  03574  M @F0 10891 V
1498    DELAY1      A       @1@,TENCNT          WAIT FOR OVERLAP          11  03584  A 10489 09991
1499                BZ      *68                     TO DROP ON 7010        7  03595  J 03609 V
1500                B       DELAY1                                         7  03602  J 03584
1501                BCL1    *615                BRCH OVERLAP IN PROC       7  03609  J 03630 I
1502                BAI     *61                                            7  03616  R 03623 M G
1503                B       NO1XIT                                         7  03623  J 03685
1504                SER     DATA64              STORE ADDR REG             7  03630  G 01714 E
1505                MRCWG   EREG,DATA618        MOVE E REG MESSAGE        12  03637  D 09992 01728 D L
1506                MRCWG   BRCH1,1             MOVE BRCH INST TO 1       12  03649  D 10012 00001 D L
1507                OCW     @M2                                            1  03661
1508    HANG1       MRCWG   RESUME,1            RESTORE LOCATION 1        12  03662  D 02015 00001 D L
1509                ***  SET ERROR 01 ON ***
1510                SW      E1,EXTRA61          TURN ON ERROR IND         11  03674  , 01802 03005
15**          763* HAS **NG IN OVERL**,POSS*BLE C**SE,CONTROL TRIGGER OR END OP
```

```
PGLIN     LABEL      OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1512        FAILING. CHECK E REG CONTENTS FOR POSSIBLE CLUE.-E REG SETTING
1513        TYPED IN ERROR MESSAGE-
1514      NO1XIT     B      MONITR                                            7  03685  J 02101
```

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1516
1517                ***  TEST ROUTINE DESCRIPTION  ***
1518                *** TEST ERROR CONDITIONS ON 7631 AFTER MACHINE RESET ***
1519          THIS ROUTINE CHECKS FOR ANY STATUS INDICATORS TURNED ON BY THE
1520          I/O NO-OP ISSUED IN ROUTINE NO1.-A SEEK OP IS USED IF PRIORITY IS
1521          NOT AVAILABLE-IF ANY INDICATORS ARE FOUND ON ERROR 02 IS
1522          INDICATED.
1523     NO2        NOP
1524                DC      #02#                ROUTINE ID            1  03692  N
1525                BCE     INCON,1264,1        BRCH IF PRIORITY      2  03694
1526                MRCG    CEADDR,FILE         SET FILE ADDR        12  03695  B 03729 01264 I
1527                SC      1,FILE              SEEK DISK            12  03707  D 10342 10891 *
1528     INCON      BAI     *&8                 CHECK FOR ANY IND    10  03719  M %F0 10891 R
1529                B       NO2XIT                                    7  03729  R 03743 GM
1530                ***  SET ERROR 02 ON ***                          7  03736  J 03749
1531                SW      E2                  TURN ON ERROR IND     6  03743  , 01803
1532          STATUS INDICATOR TURNED ON BY 7631 AFTER A MACHINE RESET,POSSIBLE
1533          TROUBLE WITH ERROR LATCHES IN 7631.
1534     NO2XIT     B       MONITR                                    7  03749  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1536          THIS ROUTINE CHECKS THE SEEK TEST OR I/O NO-OP INST TO INSURE
1537        THAT THE 7631 DOES NOT TREAT IT AS A NORMAL SEEK.TWO SUCCESSIVE
1538        SEEKS ARE ISSUED TO THE SAME LOCATION TO INSURE BUSY IS DOWN.A
1539        SEEK TEST TO ANOTHER LOCATION IS ISSUED FOLLOWED BY A NORMAL SEEK
1540        IF BUSY IS UP THE SEEK TEST CAUSED THE ACCESS TO MOVE AND ERROR
1541        17 IS INDICATED.THIS ROUTINE IS RUN ONLY IF PRIORITY IS AVAILABLE
1542
1543      N27       NOP                                                    1  03756  N
1544                DC      @27@                                           2  03758
1545                BCE     *&8,1264,1          BRCH IF PRUORITY AVAIL    12  03759  B 03778 01264 1
1546                B       N27XIT                                         7  03771  J 03911
1547                SC      1,FILE              POSITION ACC              10  03778  M %F0 10891 R
1548                BCB1    *-16                                           7  03788  R 03776 2
                                                                                      G
1549                BA1     *&1                                            7  03795  R 03802 M
1550                SC      1,FILE              INSURE THAT BUSY LINE IS DOWN 10  03802  M %F0 10891 R
1551                BCB1    *-16                                           7  03812  R 03802 2
                                                                                      G
1552                BA1     *&1                                            7  03819  R 03826 M
1553                MLCA    @00000,FILE&5       RESET FILE ADDR           12  03826  D 10506 10896 T
1554                MU      @F0,FILE,V          I/O NO-OP SEEK            10  03838  M @F0 10891 V
1555                BCB1    *-16                                           7  03848  R 03838 2
                                                                                      G
1556                BA1     *&1                                            7  03855  R 03862 M
1557                MRCG    CEADDR,FILE         RESTORE FILE ADDR         12  03862  D 10342 10891 $
1558                SC      1,FILE              SEE IF NO-OP CAUSED ACC TO MOVE 10  03874  M %F0 10891 R
1559                BCB1    *&15                BRCH IF BUSY IS ON         7  03884  R 03905 2
                                                                                      G
1560                BA1     *&1                                            7  03891  R 03898 M
1561                B       N27XIT                                         7  03898  J 03911
1562                ***  SET ERROR 17 ON  ***
1563                SW      E17                 SET ERROR IND ON           6  03905  , 01818
1564          I/O NO-OP TREATED AS NORMAL SEEK BY 7631
1565      N27XIT    B       MONITR                                         7  03911  J 02101
```

```
PGLIN    LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1567
1568                ***  TEST ROUTINE DESCRIPTION  ***
1569                *** TEST SERIAL REG AND PARITY TRIGGER ***
1570          USING A SEEK OP ALL 64 CHARS ARE SHIPPED TO THE 7631 IN THE HA2
1571          PORTION OF THE FILE ADDRESS,ONE CHARACTER AT A TIME.WHEN EVER A
1572          DATA CHECK OCCURES THE CHARACTER BEING USED IS STORED AND THE
1573          ROUTINE CONTINUES UNTIL ALL 64 CHARACTERS HAVE BEEN TESTED.IF ANY
1574          ONE OR MORE CHARACTERS CAUSED A DATA CHECK ERROR 03 IS INDICATED
1575          AND THE FAILING CHARACTERS ARE TYPED OUT.IF MORE THAN ONE CHAR.
1576          FAILED,ANALYSIS OF THE BIT MAKE UP WILL AID IN LOCATING THE BUG.
1577     NO3  NOP                                                           1  03918  N
1578          DC   @03@              ROUTINE ID                           2  03920
1579          ZA   @0000@,X10        LOAD IX 10                          11  03921  QM 10506 00074
1580          ZA   @0000@,X11        LOAD IX 11                          11  03932  QM 10506 00079
1581     CHKCHR SC   1,FILE          SEEK ACC                            10  03943  M %F0 10891 R
1582          BAL  *&1                                                     7  03953  R 03960 GM
1583          BER1 BADCHR            BRCH ON DATA CHECK                    7  03960  R 04021 4
1584     NEXCHR A    @1@,X10        UP DATE X10                         11  03967  A 10489 00074
1585          MLCS ALLCHR&X10,FILE&7 MOVE TEST CHAR                      12  03978  D 10'K6 10898 3
1586          MLCS ALLCHR&X10                                             6  03990  O 10'K6
1587          C    X10,@6C@          HAVE ALL CHAR BEEN                  11  03996  C 00074 10519
1588          BE   NO3XIT             CHECKED                             7  04007  J 04062 S
1589          B    CHKCHR                                                 7  04014  J 03943
1590     BADCHR MRCHG FILE&7,DATA&X11                                      12  04021  O 10898 01PAD L
1591                ***  SET ERROR 03 ON ***
1592          SW   EXTRA&1,E3        TURN ON ERROR IND                   11  04033  , 03005 01804
1593          ONE OR MORE CHARACTERS CAUSED PARITY ERROR ON A SEEK OP.FAILING
1594          CHARACTERS APPEAR AS 3RD LINE OF ERROR MESSAGE.
1595          A    @1@,X11           UPOATE X 11                         11  04044  A 10489 00079
1596          B    NEXCHR                                                 7  04055  J 03967
1597     NO3XIT B    MONIIR                                                 7  04062  J 02101
```

```
PGLIN   LABEL   OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1599
1600            ***  TEST ROUTINE DESCRIPTION  ***
1601            ***  TEST SET ACCESS INOP,ACCESS & MODULE DECODER  ***
1602      EVERY ACCESS ADDRESS POSSIBLE IS USED WITH A SET ACCESS INOR
1603      OPERATION,EACH ACCESS ON EVERY MODULE IS THEN SELECTED AND CHECK-
1604      ED FOR NOT READY,IF ANY ARE NOT ERROR 4 IS INDICATED.THE SELECTED
1605      ACCESS&MODULE IS NOT SET INOP IT IS CHECKED TO INSURE THAT IT HAS
1606      REMAINED READY,IF NOT ERROR 5 IS INDICATED.
1607
1608    N04     NOP                                                      1  04069  N
1609            DC      @04@                ROUTINE ID                   2  04071
1610            MLCWA   @00@,FILE&1         LOAD FILE ACC&MOD ADDR       12 04072  D 10521 10892 X
1611    CHKAMA  C       FILE&1,CEADDR&1     CHECK ADDR TO SELECTED ACC/MOD 11 04084  C 10892 10343
1612            BE      *&25                BRCH IF THIS IS IT           7  04095  J 04126 S
1613            MU      %F8,FILE,R          ISSUE SET ACCESS INOP        10 04102  M %F8 10891 R
1614            BCBI    *-16                                             7  04112  R 04102 2
1615            BAI     *&1                                              7  04119  R 04126 M G
1616            A       @1@,FILE            UPDATE FILE ACCESS ADDR      11 04126  A 10489 10891
1617            BCE     *&8,FILE,2          BRCH WHEN ADDR GOES TO 2     12 04137  B 04156 10891 2
1618            B       CHKAMA                                           7  04149  J 04084
1619            S       FILE                RESET ACC ADDR               6  04156  S 10891
1620            A       @1@,FILE&1          UPATE FILE MODULE ADDR       11 04162  A 10489 10892
1621            BCE     *&8,FILE&1,0        BRCH WHEN ADDR GOES TO 0     12 04173  B 04192 10892 0
1622            B       CHKAMA                                           7  04185  J 04084
1623            MLCA    @00@,FILE&1         RESET FILE ADDR              12 04192  D 10521 10892 I
1624    CHKAM   C       FILE&1,CEADDR&1     CHECK FOR ADDR EQUAL TO SLTD ACC 11 04204  C 10892 10343
1625            BE      NXTACS                MOD ADDR,BRCH IF THIS IS IT  7  04215  J 04276 S
1626            SC      1,FILE              CHECK FOR NOT READY          10 04222  M %F0 10891 R
1627            BAI     *&1                                              7  04232  R 04239 M G
1628            BNRI    NXTACS              BRCH ON NOT READY            7  04239  R 04276 1
1629            SW      E4,EXTRA&1          TURN ON ERROR IND            11 04246  , 01805 03005
1630            MRCWG   FILE,DATA           LOAD ADDR INTO ERROR DATA FLD 12 04257  D 10891 01710 D I
1631      AN ACCESS THAT WAS SET INOP DOES INDICATE NOT READY,FILE ADDRESS
1632      USED APPEARS IN ERROR MESSAGE.
1633            B       MONITR                                           7  04269  J 02101
1634    NXTACS  A       @1@,FILE            UPDATE FILE ACCESS ADDR      11 04276  A 10489 10891
1635            BCE     *&8,FILE,2          BRCH IF ADDR IS 2            12 04287  B 04306 10891 2
```

```
PGLIN     LABEL     OPCCD   OPERAND
1636                B       CHKAM
1637                A       @1&,FILE&1          UPDATE FILE MODULE ADDR
1638                S       FILE                RESET ADDR
1639                BCE     *&8,FILE&1,0        BRCH WHEN MOD ADDR GOES TO 0
1640                B       CHKAM
1641                MRCWG   CEADDR,FILE         LOAD FILE ADDR
1642                SC      1,FILE              CHECK SELECTED ACCESS AND MOD
1643                BCB1    *-16
1644                BA1     *&1
1645                BNR1    *&8                 BRCH ON NOT READY
1646                B       *&14
1647                SW      E5                  TURN ON ERROR IND
1648          SELECTED ACCESS WENT NOT READY WHEN ALL ACCESSES WHERE SET INOP,
1649          POSSIBLE FAILURE IN ACC/MOD DECODERS
1650                B       MONITR              GO REPORT ERROR
1651                MLCA    @2C@,FILE&1         SET ILLEGAL ACCESS ADDR
1652      NOACC     SC      1,FILE              ISSUE A SEEK
1653                BA1     *&1
1654                BNR1    NXTIAC              BRCH ON NOT READY
1655                SW      E6,EXTRA&1          TURN ON ERROR IND
1656          ILLEGAL ACCESS ADDR USED WITH A SEEK DOES NOT RESULT IN A NOT
1657          READY,FILE ADDR USED APPEARS IN THE ERROR MESSAGE
1658                MRCWG   FILE,DATA           LOAD FILE ADDR IN ERROR DATA FLD
1659                B       MONITR              GO REPORT ERROR
1660      NXTIAC    A       @1&,FILE            UPDATE ACC ADDR
1661                BZ      *&8                 BRCH WHEN ADDR GOES TO 0
1662                B       NOACC
1663                MRCWG   CEADDR,FILE         RESET FILE ADDR
1664      NO4XIT    B       MONITR
```

```
CT   ADDRS   INSTRUCTION
 7   04299   J 04204
11   04306   A 10489 10892
 6   04317   S 10891
12   04323   B 04342 10892 0
 7   04335   J 04204
12   04342   D 10342 10891 D L
10   04354   M %F0 10891
 7   04364   R 04354 2
 7   04371   R 04378 G M
 7   04378   R 04392 1
 7   04385   J 04405
 6   04392   , 01806

 7   04398   J 02101
12   04405   D 10523 10892 T
10   04417   M %F0 10891 R
 7   04427   R 04434 G M
 7   04434   R 04471 1
11   04441   , 01807 03005

12   04452   D 10891 01710 D L
 7   04464   J 02101
11   04471   A 10489 10891
 7   04482   J 04496 V
 7   04489   J 04417
12   04496   D 10342 10891 D L
 7   04508   J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1666
1667                ***  TEST ROUTINE DESCRIPTION  ***
1668                ***  TEST 7631 OP CODE DECODER  ***
1669          THIS ROUTINE TESTS THE OP CODE DECODERS ABIBILITY TO DECODE
1670        PROPERLY 7 OF THE 11 SPECIFIC OPERATIONS POSSIBLE.THE CODES TEST-
1671        ED ARE DONE IN A NO-OP MODE SO THAT NO OPERATIONS ARE PERFORMED,
1672        BECAUSED PRIORITY IS REQUIRED FOR THE NO-OP THIS TEST IS NOT RUN
1673        IF PRIORITY IS NOT AVAILABLE.THE ERRORS INDICATED WHEN INVALID
1674        COMMAND IS SENSED ARE.
1675                      SEEK OP CODE 0     ERROR 07
1676                      SRO  OP CODE 1     ERROR 08
1677                      TRO  OP CODE 2     ERROR 09
1678                      WDC  OP CODE 3     ERROR 10
1679                      HAD  OP CODE 5     ERROR 11
1680                      TWA  OP CODE 6     ERROR 12
1681                      WFT OP CODE 7      ERROR 13
1682        THE REMAINING OP CODES ARE OPTIONAL FEATURES AND ONE SETS THE
1683        ACCESS INOP.THEY MAY BE TESTED LATER IN THE PROGRAM.
1684      NO5         NOP                                                    1  04515  N
1685                  DC      @05@              ROUTINE ID                   2  04517
1686                  MRCG    CEADDR,FILE       LOAD FILE                   12  04518  D 10342 10801 $
1687                  SC      1,FILE            SEEK DISK                   10  04530  M %F0 10891 R
1688                  BAI     *&I                                            7  04540  R 04547 M
1689                  BEFI    *&8               CHECK FOR INVALID CD         7  04547  R 04561 8
1690                  B       *&7                                            7  04554  J 04567
1691                ***  SET ERROR 07 ON ***
1692                  SW      E7                SET ERROR IND ON             6  04561  , 01808
1693        A SEEK OP CAUSES EXT. COND-INVALID COMMAND-,CHECK OP DECODER
1694                  BCE     NO5XIT,1264,      BRCH IF PRI NOT AVL         12  04567  B 04801 01264
1695                  MU      %F1,FILE,Q        SRO OP                      10  04579  M %FI 10891 Q
1696                  BAI     *&I                                            7  04589  R 04596 M
1697                  BEFI    *&8               CHECK INVALID CODE           7  04596  R 04610 8
1698                  B       *&7                                            7  04603  J 04616
1699                ***  SET ERROR 08 ON ***
1700                  SW      E8                TURN ON ERROR IND            6  04610  , 01809
1701        A SINGLE RECORD OP CAUSES EXT COND-INVALID COMMAND-CHECK OP DECOR
1702                  MU      %F2,FILE,Q        TRO OP                      10  04616  M %F2 10891 Q
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
1703                BAI    *&1                                        7   04626  R 04633 G M
1704                BEF1   *&8              CHECK INVALID COND         7   04633  R 04647 8
1705                B      *&7                                        7   04640  J 04653
1706               *** SET ERROR 09 ON ***
1707                SW     E9               SET ERROR IND ON          6   04647  , 01810
1708          A TRACK WITHOUT ADDRESSES OP CAUSES EXT COND-INVALID COMMAND-
1709          CHECK OP DECODER
1710                MU     %F3,FILE,V       WDC OP                    10  04653  M %F3 10891 V
1711                BAI    *&1                                        7   04663  R 04670 G M
1712                BEF1   *&8              CHECK FOR INVALID CD      7   04670  R 04684 8
1713                B      *&7                                        7   04677  J 04690
1714               *** SET ERROR 10 ON ***
1715                SW     E10              SET ERROR IND ON          6   04684  , 01811
1716          A WDC OP CAUSES EXT COND-INVALID COMMAND-CHECK OP DECODER
1717                MU     %F5,FILE,Q       HAD OP                    10  04690  M %F5 10891 Q
1718                BAI    *&1                                        7   04700  R 04707 G M
1719                BEF1   *&8              CHECK INVALID CODE        7   04707  R 04721 8
1720                B      *&7                                        7   04714  J 04727
1721               *** SET ERROR 11 ON ***
1722                SW     E11              SET ERROR IND ON          6   04721  , 01812
1723          A HOME ADDRESS OP CAUSES EXT COND-INVALID COMMAND-CHECK OP DECOR
1724                MU     %F6,FILE,Q       TWA OP                    10  04727  M %F6 10891 Q
1725                BAI    *&1                                        7   04737  R 04744 G M
1726                BEF1   *&8              CHECK INVALID CODE        7   04744  R 04758 8
1727                B      *&7                                        7   04751  J 04764
1728               *** SET ERROR 12 ON ***
1729                SW     E12              SET ERROR IND ON          6   04758  , 01813
1730          A TRACK WITH ADDRESS OP CAUSES EXT COND-INVALID COMMAND-CHECK
1731          OP DECODER
1732                MU     %F7,FILE,Q       FMT OP                    10  04764  M %F7 10391 Q
1733                BAI    *&1                                        7   04774  R 04781 G M
1734                BEF1   *&8              CHECK INVALID CODE        7   04781  R 04795 8
1735                B      *&7                                        7   04788  J 04801
1736               *** SET ERROR 13 ON ***
1737                SW     E13              SET ERROR IND ON          6   04795  , 01814
1738          A WRITE FORMAT OP CAUSES EXT COND-INVALID COMMAND-CHECK OP DECOR
1739     NOSXIT     B      MONITR                                     7   04801  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1741
1742                ***  TEST ROUTINE DESCRIPTION  ***
1743                *** TEST HI ORDER POSITIONS OF TRACK REGISTER  ***
1744                     ***  ACCESS POSITIONED AT CYLINDER 000 ***
1745          THIS TEST IS RUN ONLY WHEN MANUAL MODE HAS BEEN SELECTED.THE
1746          ACCESS IS FIRST POSITIONED MANUALLY TO CYL 000 BY THE CE,THEN A
1747          SEEK IS ISSUED TO EACH TRACK POSITION IN CYL 000.EACH SEEK IS
1748          FOLLOWED BY A SEEK TO THE SAME ADDRESS AND BUSY IS CHECKED.IF
1749          BUSY COMES ON THE ACCESS HAS MOVED INDICATING THE TRACK REGISTER
1750          IMPROPERLY DECODED THE ADDRESS.IF THIS HAPPENS ERROR 14 IS IND-
1751          ICATED AND THE FAILING ADDRESS IS STILL PRESENT AT THIS TIME.
1752     N06  NOP                                                    1  04808  N
1753          CC   @06@              ROUTINE ID                     2  04810
1754          BCE  *&8,SPTAD1,1      BRCH IF IN MANUAL             12  04811  B 04830 01005 1
1755          B    N06XIT                                           7  04823  J 05264
1756          B    TYP1                                             7  04830  J 01593
1757          CCW  @ACC TO CYL 000@,G                              14  04850
1758          H                      WAIT FOR ACTION               1  04852  .
1759          MLCA @00000@,FILE&5    LOAD FILE ADDR                12  04853  D 10506 10896 T
1760          MLCA CEADDR&1,FILE&1   RESET FILE ADDR               12  04865  D 10343 10892 I
1761     CYL000 SD   1,FILE           SEEK ACCESS                   10  04877  M %F0 10891 R
1762          BAI  *&1                                             7  04887  R 04894 GM
1763          SD   1,FILE            SEEK ACCESS AGAIN             10  04894  M %F0 10891 R
1764          BAI  *&1                                             7  04904  R 04911 GM
1765          BCBI ZEROCK            CHECK FOR BUSY                7  04911  R 04948 2
1766     NEXTRK A    @1@,FILE&5      UPDATE TRACK ADDR             11  04918  A 10489 10896
1767          BCE  N06XIT,FILE&4,4   CYLINDER COMPLETE              12  04929  B 04968 10895 4
1768          B    CYL000                                          7  04941  J 04877
1769               ***  SET ERROR 14 ON ***
1770     ZEROCK SW   E14              SET ERROR IND ON              6  04948  , 01815
1771       A SEEK TO ONE OF THE TRACKS IN CYL 000 CAUSED ACCESS TO MOVE.
1772          BAI  STACHK            BRCH TO STATUS CHK            7  04954  R 03086 GM
1773          B    NEXTRK              RETURN HERE                 7  04961  J 04918
1774     N06XIT B    MONITR                                        7  04968  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1776
1777                ***  TEST ROUTINE DESCRIPTION  ***
1778                ***  TEST HI ORDER POSITION OF TRACK REGISTER  ***
1779          THIS IS THE SAME AS RCUTINE NC6
1780          THIS IS THE SAME AS RCUTINE NC6 EXCEPT THAT THE ACCESS IS
1781        POSITICNED AT CYLINDER 110 AND SEEKS ARE ISSUED FOR EACH TRACK
1782        IN THE CYLINDER.IF THE ACCESS MOVES ERROR 15 IS INDICATED.FOR
1783        MORE DETAIL REFER TO RCUTINE NC6.
1784
1785      N07         NCP                                                     1  04975  N
1786                  DC      @07@              RDUTINE ID                    2  04977
1787                  B       TYP1                                            7  04978  J 01593
1788                  DCW     @ACC TO CYL 11C@,C                           14  04998
1789                  H                         WAIT FCR ACTION               1  05000  .
1790                  MLCA    @4400@,FILE&5     LDAD FILE                    12  05001  D 10527 10896 T
1791                  MLCA    CEADOR&1,FILE&1   RESET FILE ADDR              12  05013  D 10343 10892 T
1792      CYL110      SC      1,FILE            SEEK ACCESS                  10  05025  M %F0 10891 R
1793                  BA1     *&1                                             7  05035  R 05042 GM
1794                  SC      1,FILE            SEEK ACCESS AGAIN            10  05042  M %F0 10891 R
1795                  BA1     *&1                                             7  05052  R 05059 GM
1796                  BCB1    ONETEN            BRCH BUSY                     7  05059  R 05096 2
1797      UP1TRK      A       @1@,FILE&5        A00 1 TO TKHD ADDR           11  05066  A 10489 10896
1798                  BCE     N07XIT,FILE&4,4   BRCH IF CYL COMP             12  05077  B 05116 10895 4
1799                  B       CYL110                                          7  05089  J 05025
1800                ***  SET ERROR 15 ON ***
1801      ONETEN      SW      E15               SET ERROR IND ON              6  05096  , 01816
1802        A SEEK TO ONE OF THE TRACKS IN CYL 110 CAUSED ACCESS TO MOVE
1803                  BA1     STACHK            GO TO ERROR RDUTINE           7  05102  R 03086 GM
1804                  B       UP1TRK               RETURN HERE                7  05109  J 05066
1805      N07XIT      B       MONITR                                          7  05116  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1807
1808                ***  TEST ROUTINE DESCRIPTION  ***
1809                ***  TEST HI ORDER POSITION OF TRACK REGISTER  ***
1810                     *** ACCESS POSITIONED AT CYL 194  ***
1811          THIS IS THE SAME AS ROUTINE NO5 & NO7 EXCEPT THAT THE ACCESS IS
1812          POSITIONED AT CYLINDER 194.ERROR 16 IS INDICATED IF THE ACCESS
1813          MOVES.REFER TO ROUTINE NO6 DESCRIPTION FOR MORE DETAIL.
1814     N08  NOP                                                           1  05123  N
1815          DC   @08@                 ROUTINE ID                       2  05125
1816          B    TYP1                                                  7  05126  J 01593
1817          DCW  @ACC TO CYL 194@,G                                    14  05146
1818          H                         WAIT FOR ACTION                  1  05148  .
1819          MLCA @77602@,FILE@5       LOAD FILE                       12  05149  D 10531 10896 I
1820          MLCA CEA00R@1,FILE@1      RESET FILE ADDR                 12  05161  D 10343 10892 I
1821     CYL194 SC   1,FILE             SEEK ACCESS                     10  05173  M %F0 10891 R
                                                                                      G
1822          BA1  *@1                                                  7  05183  R 05190 M
1823          SC   1,FILE               SEEK ACCESS AGAIN               10  05190  M %F0 10891 R
                                                                                      G
1824          BA1  *@1                                                  7  05200  R 05207 M
1825          BCB1 ONE94                BRCH BUSY                       7  05207  R 05244 2
1826     TRKUP1 A   @1@,FILE@5          UPDATE TRACK ADDR               11  05214  A 10489 10896
1827          BCE  NO8XIT,FILE@4,C      BRCH IF CYL COMPLETE            12  05225  B 05264 10895 0
1828          B    CYL194                                                7  05237  J 05173
1829                ***  SET ERROR 16 ON ***
1830     ONE94     SW   E16               SET ERROR IND ON                 6  05244  , 01817
1831          A SEEK TO ONE OF THE TRACKS IN CYL 194 CAUSED ACCESS TO MOVE
                                                                                      G
1832          BA1  STACHK               GO TO ERROR ROUTINE               7  05250  R 03086 M
1833          B    TRKUP1                  RETURN HERE                    7  05257  J 05214
1834     NO8XIT B   MONITR                                                 7  05264  J 02101
```

```
PGLIN    LABEL     OPCCD  OPERAND                                          CT  ADDRS  INSTRUCTION

1836
1837                ***  TEST ROUTINE DESCRIPTION  ***
1838                ***  TEST WRITE FORMAT OPERATION ***
1839          USING AN CVERLAPPED WRITE FORMAT THIS TEST CHECKS FOR A HANG
1840          CONDITION IN THE 7631 DUE TO IMPROPER DECODING AND HANDLING OF
1841          THE WRITE FORMAT OPERATION.IF CVERLAP IN PROCESS REMAINS ON AFTER
1842          THE FORMAT OPERATION SHOULD HAVE BEEN COMPLETED THE SETTING OF
1843          THE E REG IS CHECKED AND ERROR 18 IS INDICATED.THE CONTENTS OF
1844          THE E REG ARE ALSO DISPLAYED WITH THE ERROR MESSAGE.THIS TEST IS
1845          BYPASSED IF CVERLAP IS NOT AVAILABLE.TEN PASSES ARE MADE
1846
1847          FORMAT ORGANIZATION
1848          GAP1--HA1 33 CHARS--GAP3
1849
1850          FORMAT USED
1851          4444443333333333333333333333333333334
1852
1853    NO9       NOP                                                    1  05271  N
1854              DC      @09@              ROUTINE ID                   2  05273
1855              MRDG    CEADDR,FILE       LOAD FILE ADDR              12  05274  D 10342 10891 S
1856              SC      1,FILE            SEEK ACCESS                 10  05286  M %F0 10891 R
1857              BC81    *-16                                           7  05296  R 05286 2
1858              BA1     *&1                                            7  05303  R 05310 M G
1859              B       TYP1              GO TYPE MESSAGE              7  05310  J 01593
1860              DCW     @ACC 0 TO CYL 250@,G                          16  05332
1861              H                         WAIT FOR ACTION              1  05334  .
1862              BCE     *&8,1264,1        BRCH IF PRIORITY            12  05335  B 05354 01264 1
1863              B       NO9XIT                                         7  05347  J 05538
1864    TST9      CS      DATAFD&99         CLEAR DATA FIELD             6  05354  / 10999
1865              S       LNGCNT                                         6  05360  S 10104
1866              MRDWG   TSTFMT,DATAFD      LOAD FORMAT                12  05366  D 10238 10900 D L
1867              MLDS    OVRLAP&X14,*&2    MOVE OVER LAP CODE          12  05378  D 10DP1 05391 3
1868              MU      @F7,FILE,W        WRITE FORMAT OVERLAP        10  05390  M @F7 10891 W
1869    DELAY2    A       @1@,LNGCNT        ADD 1 TO DELAY              11  05400  A 10489 10104
1870              BCL1    *&15              BRCH ON OVERLAP              7  05411  J 05432 1
1871              BA1     STACHK            GO TO STATUS CHECK           7  05418  R 03086 M G
1872              B       PASS9                                          7  05425  J 05513
```

```
PGLIN    LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1873               BCE    *&8,LNGCNT-3,2     IS DELAY OVER         12  05432  B 05451 10101 2
1874               B      DELAY2                                    7  05444  J 05400
1875               SER    DATA&4             STORE E REG            7  05451  G 01714 E
1876               *** SET ERROR 18 ON ***
1877               SW     E18,EXTRA&1        SET ERROR IND ON      11  05458  , 01819 03005
1878       A WRITE FORMAT OPERATION CAUSES 7631 TO HANG UP,THE CONTENTS OF
1879       THE E REG AFTER THE WRITE FORMAT ARE DISPLAYED IN THE ERROR MESS-
1880       AGE.IF THE E REG SETTING INDICATES ONLY THE ADDRESS WAS TRANS-
1881       FERRED,POSSIBLE FAILURE OF PREP READ-WRITE OR WRITE LINE.IF THE
1882       E REG SETTING INDICATES SOME PART OF THE DATA FIELD WAS TRANS-
1883       FERRED,POSSIBLE FAILURE IN THE REVOLUTION COUNTER.
1884               MRCWG  EREG,DATA&6        MOVE MESG             12  05469  D 09992 01716 D L
1885               MRCWG  BRCH2,1            MOVE BRCH INST        12  05481  D 10105 00001 D L
1886               OCW    a[G]Ma             RESET COMPUTER         1  05493
1887    HANG2      MRCWG  RESUME,1           RESTORE LOCATION 1    12  05494  D 02015 00001 D L
1888               B      NO9XIT                                    7  05506  J 05538
1889    PASS9      A      a1&,TENCNT         ADD 1 TO PASS COUNT   11  05513  A 10489 09991
1890               BZ     NO9XIT             BRCH ON ZERO RESULT    7  05524  J 05538 V
1891               B      TST9                                      7  05531  J 05354
1892    NO9XIT     B      MONITR                                    7  05538  J 02101
```

```
PGLIN     LABEL     OPCCO  OPERAND                                          CT  ADDRS  INSTRUCTION

1894
1895                ***  TEST ROUTINE DESCRIPTION  ***
1896                *** FORMAT CHAR DECODER,PHASE SELECT CKTS  ***
1897          THIS TEST WRITES 8 BIT AND 6 BIT MODE FORMATS ON CYL 250.AFTER
1898          EACH WRITE FORMAT EXT COND,DATA CHECK,WRONG LENGTH RECORD,NO
1899          TRANSFER,AND THE NUMBER OF CHARACTERS TRANSFERRED ARE CHECKED.
1900          DIFFERENT COMBINATIONS OF THESE INDICATORS BEING ON CAUSE ERRORS
1901          TO BE INDICATED.THE FOLLOWING COMBINATIONS CAUSE THE FOLLOWING
1902          ERRORS.
1903              EXT COND                                    ERROR1
1904              EXT COND&WLR                                ERROR 22
1905              EXT COND&WLR&NO TRANS                       ERROR 23
1906              EXT COND&NOT ALL DATA TRANS                 ERROR 20
1907              DATA CHECK                                  ERROR 19
1908          TEN PASSES ARE MADE PROVIDED NO ERRORS OCCUR,WHEN AN ERROR DOES
1909          OCCURE THE TEST IS TERMINATED.
1910
1911          FORMAT ORGANIZATION
1912          GAP1--HA1 33 CHARS--GAP3
1913
1914          FORMAT FIELD 8 BIT MODE
1915          4444443333333333333333333333333333334
1916
1917          FORMAT FIELD 6 BIT MODE
1918          444444111111111111111111111111111111112
1919
1920     N10  NCP                                                          1  05545  N
1921          CC       a1C@                                               2  05547
1922          CS       DATAFD&99          CLEAR DATA FIELD                6  05548  / 10999
1923     CNE3SW  NCPWM                                                     1  05554  N
1924          8        ONES                                               7  05555  J 05581
1925          MRCWG    TSTFMT,DATAFD      LOAD FORMAT WITH 3S            12  05562  D 10238 10900 L
1926          8        *&13                                               7  05574  J 05593
1927     CNES MRCWG    TSTFT6,DATAFD      LOAD FORMAT WITH 3S            12  05581  D 10279 10900 L
1928          MU       %F7,FILE,W         WRITE FORMAT                   10  05593  H %F7 10091 W
1929          SBR      DATA&4             STORE B ADDR REG                7  05603  G 01714 B
1930          BA1      *&1                                                7  05610  R 05617 M
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
1931                BEF1   CHKWLR            CHECK EXT COND           7  05617  R 05693 B
1932                BER1   SETE19            CHECK DATA CHECK         7  05624  R 05777 4
1933                A      @1@,TENCNT         ADD 1 TO PASS CNT       11  05631  A 10489 09991
1934                BZ     N10XIT             BRCH ON ZERO RESULT      7  05642  J 05783 V
1935      THREE1    NOPWM                                               1  05649  N
1936                B      *&19                                        7  05650  J 05675
1937                SW     THREE1&1,ONE3SW&1  TURN ON SWITCHES FOR     11  05657  , 05650 05555
1938                B      ONE3SW                6 BIT MODE FORMAT     7  05668  J 05554
1939                CW     THREE1&1,ONE3SW&1  TURN OFF SWITCHES        11  05675  ¤ 05650 05555
1940                B      ONE3SW                                      7  05686  J 05554
1941      CHKWLR    BWL1   CHKNOT            CHECK WRONG L IN         7  05693  R 05744 -
1942                C      DATA&4,CON1        WAS DATA TRANSFERED     11  05700  C 01714 10117
1943                BE     *&14               IF SO                    7  05711  J 05731 S
1944                ***  SET ERROR 20 ON ***
1945                SW     E20                SET ERROR IND ON         6  05718  , 01821
1946        WRITE FORMAT CAUSES EXT COND AND NOT ALL THE DATA IS TRANSFERRED,
1947        POSSIBLE FAILURE IN PHASE SELECT CKTS ASSOCIATED WITH WRITE.
1948                B      N10XIT                                      7  05724  J 05783
1949                ***  SET ERROR 21 ON ***
1950                SW     E21                SET ERROR IND ON         6  05731  , 01822
1951        WRITE FORMAT CAUSES EXT COND WITH ALL DATA BEING TRANSFERRED
1952        POSSIBLE CAUSE,DISCONNECT NOT RECOGNIZED.
1953                B      N10XIT                                      7  05737  J 05783
1954      CHKNOT    BNT1   *&14               CHECK NO TRANSFER        7  05744  R 05764 S
                                                                                              8
1955                ***  SET ERROR 22 ON ***
1956                SW     E22                SET ERROR IND ON         6  05751  , 01823
1957        WRITE FORMAT CAUSES EXT COND,&WLR,ALL DATA WAS TRANSFERRED,
1958        POSSIBLE 1301 CKT CHECK
1959                B      N10XIT                                      7  05757  J 05783
1960                ***  SET ERROR 23 ON ***
1961                SW     E23                SET ERROR IND ON         6  05764  , 01824
1962        WRITE FORMAT CAUSES EXT COND,WLR,& NO TRANSFER,POSSIBLE FAILURE
1963        OF CE-MAC SWITCH ON OR THE ASSOCIATED CKTS.
1964                B      N10XIT                                      7  05770  J 05783
1965                ***  SET ERROR 19 ON  ***
1966      SETE19    SW     E19                SET ERROR IND ON         6  05777  , 01820
1967        WRITE FORMAT CAUSES DATA CHECK, POSSIBLE FAILURE OF FORMAT
```

```
PGLIN    LABEL     OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION

1968               CHARACTER DECODER.
1969     N10XIT    B      MONITR                      7  05783  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1971
1972                ***  TEST ROUTINE DESCRIPTION  ***
1973                ***  TEST WRITE DISK OPERATION  ***
1974          THIS CHECKS THE OPERATION OF GAP DETECTORS,WRITE FORMAT CKTS,
1975         PHASE SELECTION ASSOCIATED WITH READ,AND DECODING AND OPERATING
1976         A WRITE DISK CHECK.USING THE FORMAT WRITTEN IN ROUTINE N10 AN
1977         OVERLAPPED WDC IS ISSUED AND IF OVERLAP DOES NOT DROP AFTER A
1978         GIVEN PERIOD OF TIME ERROR 25 IS INDICATED.FOLLOWING THIS A NON-
1979         OVERLAPPED WDC IS ISSUED AND EXT COND AND WLR ARE CHECKED.EXT
1980         COND CAUSES ERROR 26,EXT COND AND WLR CAUSES ERROR 26.TEN PASSES
1981         ARE MADE PROVIDED NO ERRORS OCCURE,AN ERROR CAUSES THE TEST TO
1982         TERMINATE.THE OVERLAP PORTION IS BYPASSED IF OVERLAP IS NOT
1983         AVAILABLE.
1984
1985         FORMAT ORGANIZATION
1986         GAP1--HA1 33 CHARS--GAP3
1987
1988         DATA FIELD USED
1989         444111111111111111111111111111111112
1990
1991      N11       NOP                                                    1  05790  N
1992                DC      @11@              ROUTINE ID                   2  05792
1993                S       LNGCNT                                         6  05793  S 10104
1994                MRCWG   TSTFT6,DATAF0     LOAD FORMAT                 12  05799  D 10279 10900 D L
1995                BCE     *&8,1264,1        BRCH IF OVERLAP AVAL        12  05811  B 05830 01264 1
1996                B       WDCNOV                                         7  05823  J 05965
1997                MLCS    OVRLAP&X14,*&2    MOVE OVER LAP CODE          12  05830  D 10DP1 05843 3
1998                MU      @F3,FILE,W        OVERLAPPED WDC              10  05842  M @F3 10891 W
1999      DELAY3    A       @1@,LNGCNT        ADD 1 TO DELAY COUNT        11  05852  A 10489 10104
2000                BCL1    *&15                                           7  05863  J 05884 1 G
2001                BAI     STACHK            GO TO STATUS CHECK           7  05870  R 03086 M
2002                B       WDCNOV                                         7  05877  J 05965
2003                BCE     *&8,LNGCNT-3,2    IS DELAY COMPLETE           12  05884  B 05903 10101 2
2004                B       DELAY3                                         7  05896  J 05852
2005                SER     DATA&4            STORE E REG                  7  05903  G 01714 E
2006                MRCWG   EREG,DATA&7       MOVE MESSAGE                12  05910  D 09992 01717 D L
2007                MRCWG   BRCH3,I           MOVE BRCH INST              12  05922  D 10118 00001 C L
2008                ***  SET ERROR 25 ON  ***
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDR$  INSTRUCTION

2009                SW     E25,EXTRA&1        SET ERROR IND ON        11  05934  , 01826 03005
2010          WRITE DISK CHECK CAUSES 7631 TO HANG UP,CPU STAYS IN OVERLAP.
2011                DCW    @M@                                         1  05945
2012      HANG3     MRCWG  RESUME,1           RESTORE LOC 1           12  05946  D 02015 00001 L
2013                B      N11XIT                                      7  05958  J 06040
2014      WDCNCV    WDC    1,FILE             WDC NON-OVERLAP         10  05965  M %F3 10891 W
2015                BA1    *&1                                         7  05975  R 05982 M
2016                BEF1   WLRCHK             CHECK FOR EXT CCND      7  05982  R 06014 8
2017                A      @1@,TENCNT         ADD 1 TO PASS COUNT     11  05989  A 10489 09991
2018                BZ     N11XIT             BRCH ON ZERO RESULT      7  06000  J 06040 V
2019                B      N11                                         7  06007  J 05790
2020      WLRCHK    BWL1   *&14               CHECK WLR                7  06014  R 06034 -
2021                ***  SET ERROR 26 ON  ***
2022                SW     E26                SET ERROR IND ON         6  06021  , 01827
2023          WRITE DISK CHECK CAUSES EXT COND,POSSIBLE FAILURE OF GAP DETECTOR
2024                B      N11XIT                                      7  06027  J 06040
2025                ***  SET ERROR 27 ON  ***
2026                SW     E27                SET ERROR IND ON         6  06034  , 01828
2027          WRITE DISK CHECK CAUSES EXT CONO AND WLR,POSSIBLE FAILURE OF
2028          WRITE FORMAT CKTS,CR PHASE SELECT CKTS ASSOCIATED WITH READ.
2029      N11XIT    B      MONITR                                      7  06040  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2031
2032                ***  TEST ROUTINE DESCRIPTION  ***
2033                ***  TEST FORMAT CHARACTER DECODER  ***
2034          USING A NORMAL FORMAT FIELD,6 BIT MODE,WITH ONE ILLEGAL CHARACTR
2035          INSERTED,A WRITE FORMAT IS ISSUED AND  DATA CHECK IS CHECKED.IF
2036          DATA CHECK IS OFF,NO ILLEGAL CHARACTER DETECTED,ERROR 28 IS IND-
2037          ICATED.IF DATA CHECK IS ON,THE NUMBER OF CHARACTERS TRANSFERRED
2038          IS CHECKED,AND IF IT  DOES NOT REFLECT THE POSITION OF THE
2039          ILLEGAL CHARACTER IN THE DATA FIELD ERROR 29 IS INDICATED.A PASS
2040          IS MADE FOR EVERY POSSIBLE ILLEGAL CHARACTER EXCEPT IF AN ERROR
2041          OCCURES THE TEST IS TERMINATED.
2042
2043          FORMAT ORGANIZATION
2044          GAP1--HA1--GAP2--HA2 6 CHARS--X GAP--REC ADDR 10 CHARS--Y GAP--
2045          RECORD AREA 6 CHARS--GAP3
2046
2047          FORMAT DATA FIELD USED,6 BIT MODE -ILLEGAL CHAR IN POSITION 26-
2048          4444443333333333334333333333333341X1111111222222222222222111111111
2049          1111121111111111111121111111112
2050
2051     N12  NOP                                                           1  06047  N
2052          CC        @12@                 ROUTINE ID                   2  06049
2053          CS        DATAFD&99            CLEAR DATA FIELD             6  06050  / 10999
2054          MRCWG     HA1-32,DATAFD        LOAD FORMAT                 12  06056  D 10142 10900 DL
2055          ZA        @0C00@,X1D           LOAD IX ID                  11  06068  DM 10506 00074
2056     SETBAC MLCS    ALLCHR&X10,DATAFD&34      SET ILLEGAL CODE       12  06079  D 10K6 10934 3
2057          MU        %F7,FILE,W           WRITE FORMAT                10  06091  M %F7 10891 W
2058          SBR       DATA&4               STORE BAR                    7  06101  G 01714 BG
2059          BAL       *&1                                               7  06108  R 06115 M
2060          MRCWG     BREG,DATA&7          MOVE MESG                   12  06115  D 09998 01717 DL
2061          BER1      CHKLOC               CHECK DATA CHECK             7  06127  R 06152 4
2062                ***  SET ERROR 28 ON  ***
2063          SW        E28,EXTRA&1          SET ERROR IND ON            11  06134  , 01829 03005
2064          WRITE FORMAT USING AN ILLEGAL CHARACTER IN DATA FIELD DOES NOT
2065          CAUSE DATA CHECK.POSSIBLE FAILURE OF FORMAT CHAR DECODER.FAILING
2066          CHARACTER IS STILL PRESENT IN DATA FIELD AT TIME ERROR IS IND.
2067          B         N12XIT                                             7  06145  J 06218
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
2068      CHKLOC    C      DATA&4,CON2          WAS CORRECT CHAR      11  06152  C 01714 10141
2069                BE     GETCHR                 DETECTED AS ILLEGL   7  06163  J 06188 S
2070                *** SET ERROR 29 ON ***
2071                SW     E29,EXTRA&1          SET ERROR IND ON      11  06170  , 01830 03005
2072        WRITE FORMAT USING AN ILLEGAL CHARACTER IN DATA FIELD,THE WRONG
2073        CHARACTER CAUSES DATA CHECK.B REG CONTENTS EQUALS 2 CHARACTERS
2074        ABOVE ONE THAT CAUSED DATA CHECK.POSSIBLE FAILURE OF FORMAT CHAR
2075        DECODER,DECODING LEGAL CHARACTER AS ILLEGAL.
2076                B      N12XIT                                       7  06181  J 06218
2077      GETCHR    A      a1&,X10              UP DATE IX 10         11  06188  A 10489 00074
2078                BCE    N12XIT,X10-1,5       HAVE ALL ILLEGAL      12  06199  B 06218 00073 5
2079                B      SETBAD                 CHARS BEEN CHKD      7  06211  J 06079
2080      N12XIT    B      MONITR                                       7  06218  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2082
2083                ***  TEST ROUTINE DESCRIPTION  ***
2084                ***  TEST GAP DETECTORS  ***
2085          A NORMAL 6 BIT MODE FORMAT IS WRITTEN,THIS IS FOLLOWED BY FOUR
2086          WRITE DISK CHECKS IN WHICH THE GAPS IN DATA FIELD ARE VARIED AND
2087          EXTERNAL CONDITION IS CHECKED,IF IT IS NOT ON AN ERROR IS INDI-
2088          CATED.
2089              1ST WDC  LENGTHEN LONG X GAP          NO EXT COND ERROR 30
2090              2ND WDC  SHORTEN LONG X GAP           NO EXT COND ERROR 31
2091              3RD WDC  LENGTHEN SHORT GAP 2         NO EXT COND ERROR 32
2092              4TH WDC  SHORTEN SHORT GAP 2          NO EXT COND ERROR 33
2093          AFTER THESE A WDC WITH ALL GAPS NORMAL CHECKS TO INSURE FORMAT
2094          WAS RECORDED CORRECTLY.TEN PASSES ARE MADE THROUGH THE ROUTINE.
2095
2096          FORMAT ORGANIZATION
2097          GAP1--HA1--GAP2--HA2 6 CHARS--X GAP--REC ADDR 10 CHARS--Y GAP--
2098          RECORD AREA 6 CHARS--GAP3
2099
2100          FORMAT DATA FIELD USED
2101          444444333333333333433333333333341111111112222222222222221111111
2102          1111121111111111111211111111112
2103
2104     N13  NCP                                                           1  06225  N
2105          DC       @13@              ROUTINE ID                      2  06227
2106          S        TENCNT                                            6  06228  S 09991
2107     TST13 CS      DATAFD&99         CLEAR DATA FIELD                6  06234  / 10999
2108          MRCWG    HA1-32,DATAFD     LOAD FORMAT                    12  06240  D 10142 10900 L
2109          MU       %F7,FILE,W        WRITE FORMAT                   10  06252  M %F7 10891 W
                                                                                        G
2110          BAI      *&1                                               7  06262  R 06269 M
2111          MLCS     @2&,DATAFD&57     LENGTHEN LONG GAP              12  06269  D 10502 10957 3
2112          WDC      1,FILE            WRITE DISK CHECK               10  06281  M %F3 10891 W
                                                                                        G
2113          BAI      *&1                                               7  06291  R 06298 M
2114          BEFI     *&7               CHECK EXTERNAL COND             7  06298  R 06311 8
2115                ***  SET ERROR 30 ***
2116          SW       E3C               SET ERROR IND ON                6  06305  , 01831
2117          WRITE DISK CHECK OF FORMAT WITH X GAP INCREASED BY 1 CHAR DOES
2118          NOT CAUSE EXT COND,POSSIBLE FAILURE OF GAP DETECTOR
2119          MLCA     @11@,DATAFD&57    SHORTEN LONG GAP               12  06311  D 10533 10957 I
```

```
PGLIN    LABEL    OPCCO  OPERAND                                  CT  ADDRS  INSTRUCTION

2120              WCC    1,FILE            WRIT OISK CHECK        10  06323  M %F3 10891 W
2121              BAL    *&1                                       7  06333  R 06340 M
                                                                          G
2122              BEF1   *&7               CHECK EXT CCND          7  06340  R 06353 8
2123             *** SET ERROR 31 ON ***
2124              SW     E31               SET ERROR IND ON        6  06347  , 01832
2125     WRITE DISK CHECK OF FORMAT WITh X GAP SHORTENED BY 1 CHAR DOES
2126     NOT TURN CN EXT CONO.POSSIBLE FAILURE OF  GAP DETECTOR
2127              MLCA   @21@,DATAFO&57    RESTORE GAP            12  06353  D 10535 10957 I
2128              MLCA   @4&,DATAFO&33     LENGTHEN SHORT GAP     12  06365  D 10536 10933 I
2129              WCC    1,FILE            WRITE OISK CHECK       10  06377  M %F3 10891 W
2130              BAL    *&1                                       7  06387  R 06394 M
                                                                          G
2131              BEF1   *&7               CHECK FOR EXT CCNO      7  06394  R 06407 8
2132             *** SET ERROR 32 ON ***
2133              SW     E32               SET ERROR IND CN        6  06401  , 01833
2134     WRITE OISK CHECK OF FORMAT WITH GAP2 INCREASEO BY 1 CHAR DOES NOT
2135     CAUSE EXT CONO,POSSIBLE FAILURE OF GAP OETECTORS
2136              MLCA   @11@,DATAFO&33    SHORTEN SHORT GAP      12  06407  D 10533 10933 I
2137              WCC    1,FILE            WRITE OISK CHECK       10  06419  M %F3 10891 W
2138              BAL    *&1                                       7  06429  R 06436 M
                                                                          G
2139              BEF1   *&7               CHECK EXT CCND          7  06436  R 06449 8
2140             *** SET ERROR 33 ON ***
2141              SW     E33               SET ERROR IND CN        6  06443  , 01834
2142     WRITE OISK CHECK OF FORMAT WITH GAP2 SHORTENED BY 1 CHAR DOES NOT
2143     CAUSE EXT CONO,POSSIBLE FAILURE OF GAP OETECTORS
2144              MLCA   @4@,DATAFO&32     RESTORE SHORT GAP      12  06449  D 10536 10932 I
2145              WCC    1,FILE            WRITE DISK CHECK       10  06461  M %F3 10891 W
2146              BAL    STACHK            GO CHECK STATUS IND     7  06471  R 03086 M
                                                                          G
2147              A      @1@,TENCNT          RETURN HERE          11  06478  A 10489 09991
2148              BZ     N13XIT            TEN PASSES AND BRCH     7  06489  J 06503 V
2149              B      TST13                                     7  06496  J 06234
2150     N13XIT   B      MONITR                                    7  06503  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2152
2153                ***  TEST ROUTINE DESCRIPTION  ***
2154                ***  TEST HAD OPERATION  ***
2155          THE PROGRAM PERFORMS AN OVERLAPPED WRITE HAD OPERATION AND THEN
2156          DELAYS LONG ENOUGH FOR THE OPERATION TO BE COMPLETED.AT THE END
2157          OF THE DELAY IF OVERLAP IS STILL IN PROCESS ERROR 35 IS INDICATED
2158          THE CONTENTS OF THE E REG AFTER THE WRITE HAD IS ALSO DISPLAYED
2159          WITH THE ERROR MESSAGE.TEN PASS ARE MADE IF NO ERRORS OCCURE.
2160
2161          FORMAT REQUIRED
2162          SAME AS FORMAT WRITTEN BY ROUTINE N13
2163
2164          DATA FIELD ORGANIZATION
2165          HA1 5 CHARS--HA2 2 CHARS--REC ADDR 6 CHARS--RECORD 2 CHARS
2166
2167          DATA FIELD ORGANIZATION
2168          9#208881234564-
2169
2170      N14       NOP                                                    1  06510  N
2171                DC      @14@              ROUTINE ID                   2  06512
2172                BCE     *&8,1263,1        BRCH IF OVERLAP             12  06513  B 06532 01263 1
2173                B       N14XIT                                         7  06525  J 06764
2174                CS      DATAFD&99         CLEAR WRITE FLD              6  06532  / 10999
2175                MRCG    CEADDR,FILE       LOAD FILE ADDR              12  06538  D 10342 10891 8
2176                SW      FILE&2                                         6  06550  , 10893
2177                MLCA    FILE&5,DATAFD&3   LOAD                        12  06556  D 10896 10903 1
2178                MLCA    @888@,DATAFD&6        DATA                    12  06568  D 10539 10906 I
2179                MRCWG   ALLBIT,DATAFD&7           FIELD               12  06580  D 10320 10907 L  D
2180                S       TENCNT                                         6  06592  S 09991
2181                MLCS    OVRLAP&X14,*&2    MOVE OVER LAP CODE          12  06598  D 10DP1 06611 3
2182      TST14     MU      @F5,FILE,W        WRITE HAD OVERLAP           10  06610  M @F5 10891 W
2183                S       LNGCNT                                         6  06620  S 10104
2184      DELAY4    A       @1@,LNGCNT        ADD 1 TO DELAY CNT          11  06626  A 10489 10104
2185                BCLI    *&15              BRCH OVERLAP IN PRD          7  06637  J 06658 I
2186                BAI     STACHK            GO TO STATUS CHECK           7  06644  R 03086 M  G
2187                B       PASS14                                         7  06651  J 06739
2188                BCE     *&8,LNGCNT-3,2    IS DELAY COMPLETE           12  06658  B 06677 10101 2
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2189                B      DELAY4                                    7  06670  J 06626
2190                *** SET ERROR 35 ON ***
2191                SW     E35,EXTRA&1          SET ERROR IND ON    11  06677  * 01836 03005
2192          WRITE HAD OVERLAPPED CAUSES 7631 TO HANG UP
2193                SER    DATA&4               STORE E REG          7  06688  G 01714 E
2194                MRCWG  EREG,DATA&7          MOVE MESSAGE        12  06695  D 09992 01717 DL
2195                MRCWG  BRCH4,1              MOVE BRCH INST      12  06707  D 10329 00001 DL
2196                DCW    aMa                                       1  06719
2197      HANG4     MRCWG  RESUME,1             RESTORE LOC 1       12  06720  D 02015 00001 DL
2198                B      N14XIT                                    7  06732  J 06764
2199      PASS14    A      a1a,TENCNT           ADD 1 TO PASS COUNT  11  06739  A 10489 09991
2200                BZ     N14XIT               BRCH ON 10TH PASS    7  06750  J 06764 V
2201                B      TST14                                     7  06757  J 06610
2202      N14XIT    B      MONITR                                    7  06764  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2204
2205                ***  TEST ROUTINE DESCRIPTION  ***
2206                ***  TEST DATA HANDLING CAPABILITIES  ***
2207          THIS ROUTINE USES THE HAO OPERATION TO WRITE AND READ EVERY
2208        ONE OF THE 64 POSSIBLE CHARACTERS.SINCE THE CE-HAC SWITCH IS ON
2209        AT THIS TIME THE HOME ADDRESSES FOR 9#20-9#59 ARE ALSO WRITTEN.
2210        THE RECORD OF 2 CHARACTERS IS LOADED WITH ONE OF THE 64 1410
2211        CHARACTERS AND A WRITE HAO OP IS PERFORMED FOR EVERY TRACK IN
2212        CYLINDER 253.IF THE ENTIRE DATA FIELD IS NOT TRANSFERRED ON THE
2213        WRITE OP ERROR 36 IS INDICATED.AFTER EVERY TRACK HAS BEEN WRITTEN
2214        ON P READ HAO OF EVERY TRACK IS PERFORMED.EVERY READ IS FOLLOWED
2215        BY A CHECK OF EXT.COND,DATA CHECK,AND COMPARE IN MEMORY OF THE
2216        DATA FIELD READ TO THAT WRITTEN.THE FOLLOWING ERRORS CAN BE
2217        INDICATED
2218                EXT COND ON                          ERROR 39
2219                DATA CHECK ON                        ERROR 40
2220                RECORD READ DOES NOT EQUAL RECORD WRITTEN    ERROR 37
2221                HOME ADDRESS 1 DOES NOT EQUAL HOME ADDRESS 1 WRITTEN
2222                                                     ERROR 38
2223        THE ROUTINE IS REPEATED FOR ALL 64 CHARACTERS UNLESS AN ERROR
2224        OCCURES IN WHICH CASE THE TEST IS TERMINATED.
2225
2226        FORMAT REQUIRED
2227        SAME AS FORMAT WRITTEN BY ROUTINE N13
2228
2229        DATA FIELD ORGANIZATION
2230        HA1 5CHARS--HA2 2 CHARS--REC ADDR 6 CHARS--RECORD 2 CHARS
2231
2232        DATA FIELD USED-HA1 UPDATED 20-59--RECORD UPDATED FOR EVERY CHAR
2233        9#20888123456XX
2234      N15       NOP                                                  1  06771  N
2235                DC      @15@                                         2  06773
2236                ZA      @0C000@,X10          LOAD IX 10             11  06774  A 10506 00074
2237      TST15     MRCG    CEADDR,FILE          RESET FILE ADDR        12  06785  D 10342 10891 &
2238                CS      DATAFD&99            CLEAR DATA FIELD        6  06797  / 10999
2239                SW      FILE&4                                       6  06803  , 10895
2240                MRCWG   ALLBIT,DATAFD&7      LOAD DATA FIELD        12  06809  D 10320 10907 -
```

```
PGLIN   LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2241              MLCS   ALLCHR&X10,DATAFD&14  WITH REC ADDR AND   12  06821  D 10.K6 10914 3
2242              MLCS   ALLCHR&X10             TEST CHAR            6  06833  D 10.K6
2243    WRTHAD    MRCG   FILE&2,DATAFD         LOAD ADDRESS        12  06839  D 10893 10900 $
2244              MLCA   @8888,DATAFD&6                 IN FIELD    12  06851  D 10539 10906 I
2245              MW     %F5,FILE,W            WRITE HAD           10  06863  M %F5 10891 W
2246              SBR    DATA&4                STORE B ADDR REG     7  06873  G 01714 B
2247              BAI    STACHK                BRCH ON ANY IND      7  06880  R 03086 G M
2248              C      DATA&4,CON3             RETURN HERE       11  06887  C 01714 10341
2249              BE     *&14                  WAS ALL DATA TRANS    7  06898  J 06918 S
2250             *** SET ERROR 36 ON ***
2251              SW     E36                   SET ERROR IND ON      6  06905  , 01837
2252    WRITE HAD CP THE ENTIRE DATA FIELD WAS NOT TRANSFERRED,POSSIBLE
2253    FAILURE OF FORMAT RECOGNITION CKTS.
2254              B      N15XIT                                      7  06911  J 07193
2255              A      @1@,FILE&5            ADD 1 TO TKHD ADR    11  06918  A 10489 10896
2256              BCE    *&8,FILE&4,6          BRCH IF CYL COMPLETE 12  06929  B 06948 10895 6
2257              B      WRTHAD                                      7  06941  J 06839
2258              MLCS   DATAFD&14,DATAFD&31 SAVE TEST CHAR          12  06948  O 10914 10931 3
2259              MLCS                                               1  06960  D
2260              MRCG   CEADDR,FILE           RESET FILE ADDR      12  06961  O 10342 10891 $
2261              CS     DATAFD&14                                    6  06973  / 10914
2262    RDHAD     MW     %F5,FILE,R            READ HAD            10  06979  M %F5 10891 R
2263              BEFI   SETE39                CHECK EXTERNAL CCNO   7  06989  R 07174 8
2264              BER1   SETE40                CHECK DATA CHECK      7  06996  R 07187 4
2265              BAI    STACHK                GO CHECK STATUS ERR   7  07003  R 03086 G M
2266              SW     DATAFD&30                                    6  07010  , 10930
2267              C      DATAFD&14,DATAFD&31 CHECK DATA READ        11  07016  C 10914 10931
2268              BE     *&8                   IF IT IS GOOD BRCH    7  07027  J 07041 S
2269              B      SETE37                                       7  07034  J 07089
2270              CW     FILE&4                                       6  07041  ¤ 10895
2271              SW     FILE&2,DATAFD                              11  07047  , 10893 10900
2272              C      DATAFD&5,FILE&7       CHECK ADDRESS READ   11  07058  C 10905 10898
2273              BE     RDNXTK                BRCH IF ADDR CORRECT  7  07069  J 07102 S
2274             *** SET ERROR 38 ON ***
2275              SW     E38                   SET ERROR IND ON      6  07076  , 01839
2276    HOME ADDR 1 WRITTEN BY HAD OP DOES NOT COMPARE TO HOME ADDRESS
2277    READ BACK.ADDRESS READ BACK IS IN DATA FIELD AT TIME ERROR IS IND
2278    POSSIBLE FAILURE IN THE LO-ORDER POSITIONS OF THE TRACK REGISTER.
```

```
PGLIN    LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
2279               B      N15XIT                                     7   07082  J 07193
2280              ***  SET ERROR 37 ON  ***
2281     SETE37    SW     E37                SET ERROR IND ON        6   07089  , 01838
2282       DATA RECORD READ BACK DOES NOT COMPARE TO DATA RECORD WRITTEN,
2283       POSSIBLE FAILURE IN READ-WRITE PATHS.DATA RECORD READ IS IN DATA
2284       FIELD WHEN ERROR IS INDICATED.
2285               B      N15XIT                                     7   07095  J 07193
2286     RDNXTK    SW     FILE04                                     6   07102  , 10895
2287               A      @1@,FILE05         ADD 1 TO TKHD ADDR      11  07108  A 10489 10896
2288               BCE    *08,FILE04,6       BRCH IF CYL COMPLETE    12  07119  B 07138 10895 6
2289               B      RDHAD                                      7   07131  J 06979
2290               A      @1@,X1C            ADD 1 TO CHAR COUNT     11  07138  A 10489 00074
2291               C      X1C,@6C@           ALL CHARACTERS CHKD     11  07149  C 00074 10519
2292               8E     N15XIT              IF SO BRCH             7   07160  J 07193 S
2293               B      TST15                                      7   07167  J 06785
2294              *** SET ERROR 39 ON ***
2295     SETE39    SW     E39                SET ERROR IND ON        6   07174  , 0184D
2296       READ HAD CAUSES EXT COND,POSSIBLE FAILURE OF PHASE SELECT CKTS
2297       ASSOCIATED WITH READ
2298               B      N15XIT                                     7   07180  J 07193
2299              ***  SET ERROR 40 ON  ***
2300     SETE40    SW     E4C                SET ERROR IND ON        6   07187  , 01841
2301       READ HAD CAUSES DATA CHECK,POSSIBLE FAILURE OF PHASE SELECT CKTS
2302       OR READ DATA PATHS.
2303     N15XIT    B      MONITR                                     7   07193  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

2305
2306                ***  TEST ROUTINE DESCRIPTION  ***
2307                ***  TEST FLAGGING CAPABILITIES  ***
2308          THE ROUTINE REQUESTS THE NUMBER OF SPARE HEADS AVAILABLE FOR
2309          FLAGGING.USING THIS INFO THE PROGRAM WRITES A FLAG CHARACTER FOR
2310          HEAD AVAILABLE ON TRACKS 9#20-9#25 OR LESS,AND WRITES HOME ADDR-
2311          ESSES ON THE AVAILABLE ALTERNATES ALONG WITH A CODE CHARACTER.
2312          A REQUEST IS THEN MADE TO TURN OFF THE CE-HAD SWITCH,AND A READ
2313          HAD IS ISSUED TO AN UN-FLAGGED TRACK.IF THIS RESULTS IN EXT COND,
2314          ERROR 41 IS INDICATED.THE TRACK ADDRESS IS RESET TO ZERO AND AN-
2315          OTHER READ HAD IS ISSUED IF THIS DOES NOT CAUSE EXT COND ERROR 42
2316          IS INDICATED.
2317
2318          FORMAT REQUIRED
2319          SAME AS WRITTEN IN ROUTINE N13
2320
2321          DATA FIELD ORGANIZATION
2322          HA1 4 CHARS--FLAG CHAR--AA2 2 CHARS--CODE CHARACTER
2323
2324          DATA FIELD USED-HA1 UPDATED UP TO 9#25-
2325          9#20X88A
2326
2327     N16       NCP                                               1  07200  N
2328               DC        @16@                                    2  07202
2329               ZA        @00003@,X10        LOAD IX 10           11  07203  Q M 10506 00074
2330               B         TYP2                                    7  07214  J 01607
2331               DCW       @# OF SPARE HEADS@,G                    16  07236
2332     AVALTR    DCW       @ @,G                                   1  07238
2333               MLNS      AVALTR,CKALT1&11   MOVE NO. OF HEADS    12  07240  D 07238 07398 1
2334               MLNS      AVALTR,CKALT2&11   MOVE NO. OF HEADS    12  07252  D 07238 07515 1
2335               MLNS      AVALTR,CKALT3&11   MOVE NO. OF HEADS    12  07264  D 07238 07731 1
2336               MRCWG     CEADDR,FILE        LOAD FILE ADDR       12  07276  D 10342 10891 L D
2337               CS        DATAFD&99          CLEAR DATA FIELD     6  07288  / 10999
2338     TST16     MRCG      FILE&2,DATAFD      LOAD ADDR INTO FIELD 12  07294  D 10893 10900 $
2339               MLCWS     @M@,DATAFD&8 G                          12  07306  D 10487 10908 7
2340               MLCA      @888A@,DATAFD&7    LOAD CODE CHAR&HA2   12  07318  D 10543 10907 I
2341               MLCS      FLAGS&X10,FILE&6                        12  07330  D 10LN1 10897 3
```

```
PGLIN   LABEL    OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
2342             MU     %F5,FILE,W        WRITE HAD      10  07342  M %F5 10891 W
2343             BAI    *&1                              7  07352  R 07359 M
2344             A      @1a,X1C           ADD 1 TO IX 10 11  07359  A 10489 00074
2345             SW     FILE&4                           6  07370  , 10895
2346             A      @1a,FILE&5        ADD 1 TO FILE ADDR 11  07376  A 10489 10896
2347    CKALT1   BCE    *&8,X1C,F         ALL ALTERNATES USED 12  07387  B 07406 00074 F
2348             B      TST16                            7  07399  J 07294
2349             MRCG   CEADDR,FILE       RESET FILE ADDR. 12  07406  D 10342 10891 $
2350             ZA     @00003,X10        RELOAD IX 10   11  07418  M 10506 00074
2351    TST165   MRCG   FILE&2,DATAFD      LOAD ADDR INTO FLD 12  07429  D 10893 10900 $
2352             MLCA   @N2,DATAFD&7       LOAD CODE CHAR 12  07441  D 10484 10907 T
2353             MLCS   FLAGS&X10,DATAFD&4 MOVE FLAG CHAR 12  07453  D 10LN1 10904 3
2354             MU     %F5,FILE,W        WRITE HAD      10  07465  M %F5 10891 W
2355             BAI    *&1                              7  07475  R 07482 M
2356             A      @1a,X10           ADD 1 TO IX 10 11  07482  A 10489 00074
2357             A      @1a,FILE&5        ADD 1 TO ADDR  11  07493  A 10489 10896
2358    CKALT2   BCE    *&8,X1C,F         ALL FLAGS WRITTEN 12  07504  B 07523 00074 I
2359             B      TST165                           7  07516  J 07429
2360             B      TYP1                             7  07523  J 01593
2361             DCW    @CE-HAD OFF@,G                   10  07539
2362             H                        WAIT FOR ACTION 1  07541  .
2363             CS     DATAFD&99         CLEAR DATA FIELD 6  07542  / 10999
2364             MU     %F5,FILE,R        READ HAD       10  07548  M %F5 10891 R
2365             BAI    *&1                              7  07558  R 07565 M
2366             BEF1   *&8               CHECK EXT COND  7  07565  R 07579 8
2367             B      *&7                              7  07572  J 07585
2368                   *** SET ERROR 41 ON ***
2369             SW     E41               SET ERROR IND ON 6  07579  , 01842
2370       READ HAD FOLLOWING TURNING OFF CE-HAD SWITCH CAUSES EXTERNAL COND
2371       POSSIBLLY CIC NOT WRITE HOME ADDRESSES CORRECTLY IN ROUTINE N15
2372             MLCA   @0C@,FILE&3       SET IKHD ADDR TO 12  07585  D 10521 10894 T
2373             MU     %F5,FILE,R          CYL 0 AND READ HAD 10  07597  M %F5 10891 R
2374             BAI    *&1                              7  07607  R 07614 M
2375             BEF1   N16XIT            CHECK FOR EXT COND 7  07614  R 07627 8
2376                 *** SET ERROR 42 ON  ***
2377             SW     E42               SET ERROR IND ON 6  07621  , 01843
2378       READ HAD USING ADDRESS OF CYL 000 WHEN ACCESS IS AT CYL 253 DOES
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2379			NOT CAUSE EXT COND.POSSIBLE FAILURE OF CE-HAO SWITCH OFF OR ITS			
2380			ASSOCIATED CKTS.			
2381	N16XIT	B	MONITR	7	07627	J 02101

```
PGLIN     LABEL     OPCOD  OPERAND                                  C1  ADDRS  INSTRUCTION

2383
2384                ***  TEST ROUTINE DESCRIPTION  ***
2385                ***  TEST FLAG DETECTION AND SWITCHING  ***
2386          THIS ROUTINE ADDRESSES EACH  OF THE TRACRS FLAGGED IN ROUTINE 16
2387          WITH A READ HAD INSTRUCTION.THE DATA READ BACK IS CHECKED FOR THE
2388          CODE CHARACTER WRITTEN ON THE ALTERNATE TRACKS,IF THE CHARACTER
2389          IS NOT PRESENT ERROR 43 IS INDICATED.
2390
2391          FORMAT REQUIRED
2392          SAME AS WRITTEN IN ROUTINE N13
2393
2394     N17        NCP                                               1  07634  N
2395                CC        @17@              ROUTINE ID            2  07636
2396                MRCG      CEADDR,FILE       LOAD ADDR            12  07637  D 10342 10891 S
2397     TST17      CS        DATAFD&99         CLEAR DATA FIELD      6  07649  / 10999
2398                MLCWS     @M@,DATAFD&18     SET TERMINATING WMGM 12  07655  D 10487 10918 7
2399                MU        %F5,FILE,R        READ HAD             10  07667  M %F5 10891 R
2400                BAI       *&1                                     7  07677  R 07684 M
2401                BCE       CHKFLG,DATAFD&2,A WAS ALTERNATE READ   12  07684  B 07709 10902 A
2402               ***  SET ERROR 43 ON  ***
2403                SW        E43               SET ERROR IND ON      6  07696  , 01844
2404          READ HAD OF A FLAGGED TRACK DOES NOT READ ALTERNATE TRACK.
2405                B         MONITR                                  7  07702  J 02101
2406     CHKFLG     A         @1@,FILE&5        ADD 1 TO IKHD ADDR   11  07709  A 10489 10896
2407     CKALT3     BCE       N17XIT,FILE&5,6   CYL COMPLETE         12  07720  B 07739 10896 6
2408                B         TST17               CHECKED             7  07732  J 07649
2409     N17XIT     B         MONITR                                  7  07739  J 02101
```

```
PGLIN    LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
2411
2412                ***  TEST ROUTINE DESCRIPTION  ***
2413                ***  WRITE & WRITE CHECK FORMAT  ***
2414          THIS ROUTINE WRITES AND WRITE CHECKS A FORMAT ON CYLINDER 253.
2415          ANY STATUS ERRORS CAUSED BY THE WRITE FORMAT SETS ERROR 44 ON.
2416          ANY STATUS ERRORS CAUSED BY THE WRITE CHECK SETS ERROR 45 ON.
2417
2418          FORMAT ORGANIZATION
2419          GAP1--HA1--GAP2--HA2 6 CHARS--X GAP--REC ADDR 10 CHARS--Y GAP--
2420
2421          FORMAT DATA FIELD USED
2422          111112
2423    N18         NCP                                             1  07746  N
2424                CC      @18@                                    2  07748
2425                CS      DATAFD&99                               6  07749  / 10999
2426                MRCG    CEADDR,FILE         LOAD FILE ADDR     12  07755  D 10342 10891 $
2427                MRCWG   HA1-32,DATAFD       LOAD FORMAT        12  07767  D 10142 10900 D L
2428                MU      %F7,FILE,W          WRITE FORMAT       10  07779  M %F7 10891 W
2429                BAI     *&8                 CHECK ALL INDICATORS 7  07789  R 07803 G M
2430                B       *&14                                    7  07796  J 07816
2431               ***  SET ERROR 44 OR  ***
2432                SW      E44                 SET ERROR IND ON    6  07803  , 01845
2433          WRITE FORMAT,6 BIT MODE,CAUSES STATUS ERROR
2434                BAI     STACHK              GO TO STATUS ERROR  7  07809  R 03086 G M
2435                WDC     1,FILE                RETURN HERE FOR WDC
2436                BAI     *&8                 CHECK ALL INDICATORS 10 07816  M %F3 10891 W
2437                B       N18XIT                                  7  07826  R 07840 G M
2438               ***  SET ERROR 45 ON  ***                        7  07833  J 07853
2439                SW      E45                 SET ERROR IND ON
2440          WRITE CHECK FORMAT CAUSES STATUS ERROR                 6  07840  , 01846
2441                BAI     STACHK              GO TO STATUS ERROR
2442    N18XIT      B       MONITR                ROUTINE,RETURN HERE  7  07846  R 03086 G M
                                                                       7  07853  J 02101
```

```
PGLIN     LABEL      OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

2444
2445                 ***  TEST ROUTINE DESCRIPTION  ***
2446                 ***  TEST WRITE TRACK WITH ADDRESSES OPER  ***
2447          THIS ROUTINE WRITES A RECORD AND READS IT BACK ,IT COMPARES THE
2448         DATA READ WITH THE DATA WRITTEN.IF IT DOES NOT COMPARE EQUAL
2449         ERROR 46 IS INDICATED.ALL STATUS ERRORS ARE ALSO INDICATED.
2450
2451         FORMAT REQUIRED
2452         SAME AS WRITTEN BY ROUTINE N18
2453
2454         DATA FIELD ORGANIZATION
2455         REC ADDR 6 CHARS--RECORD 2 CHARS
2456
2457         DATA FIELD USED
2458         123456+-
2459
2460      N19        NOP                                               1  07860  N
2461                 CC     @19@          ROUTINE ID                   2  07862
2462                 MRCG   CEADDR,FILE   LOAD ADDR                   12  07863  D 10342 10891 $
2463                 CS     DATAFD&99     CLEAR DATA FIELD             6  07875  / 10999
2464                 MRCWG  ALLBITS,DATAFD LOAD DATA FIELD              12  07881  D 10320 10900 D L
2465                 MLCS   @6@,FILE&5    SET ADDR ABOVE TRCKS         12  07893  D 10544 10896 3
2466                                      THAT ARE FLAGGED
2467                 MU     %F6,FILE,W    WRITE TRCK WITH ADDR         10  07905  M %F6 10891 W
2468                 BAI    STACHK        BRCH ON ANY IND               7  07915  R 03086 M G
2469                 CS     DATAFD&7       RETURN HERE                 6  07922  / 10907
2470                 MU     %F6,FILE,R    READ  TRCK WITH ADDR         10  07928  M %F6 10891 R
2471                 BAI    STACHK        BRCH ON ANY IND               7  07938  R 03086 M G
2472                 C      DATAFD&7,ALLBIT&7   RETURN HERE            11  07945  C 10907 10327
2473                 BE     N19XIT        COMPARE DATA READ TO          7  07956  J 07969 S
2474                                      DATA WRITTEN
2475                ***  SET ERROR 46 ON  ***
2476                 SW     E46           SET ERROR IND ON              6  07963  . 01847
2477       DATA READ DOES NOT COMPARE TO DATA WRITTEN
2478      N19XIT     B      MONITR                                      7  07969  J 02101
```

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                    N20                                                    0C03          PAGE 202
PGLIN     LABEL     OPCOD  OPERAND                                      CT  ADDRS  INSTRUCTION

2480
2481                ***  TEST ROUTINE DESCRIPTION  ***
2482                ***  TEST TRACK WITHOUT ADDRESSES OP  ***
2483          THIS ROUTINE PERFORMS A TRACK WITHOUT ADDRESSES WRITE AND READ,
2484          THE DATA READ IS COMPARED TO THE DATA WRITTEN AND IF IT DOES NOT
2485          COMPARE EQUAL ERROR 47 IS INDICATED.ALL STATUS ERRORS ARE ALSO
2486          INDICATED.
2487
2488          FORMAT REQUIRED
2489          SAME AS WRITTEN BY ROUTINE N18
2490
2491          DATA FIELD ORGANIZATION
2492          RECORD 2 CHARS
2493
2494          DATA FIELD USED
2495          +-
2496     N20          NOP                                                  1  07976  N
2497                  DC      @20@              ROUTINE ID                 2  07978
2498                  MRCG    CEACOR,FILE       LOAD ADDR                 12  07979  O 10342 10891 $
2499                  CS      DATAFD&99         CLEAR DATAFD               6  07991  / 10999
2500                  MRCWG   ALLBIT&6,DATAFD   LOAD DATA FIELD           12  07997  D 10326 10900 D L
2501                  MLCS    @6@,FILE&5        SET ADDR ABOVE TRCKS      12  08009  O 10544 10896 3
2502                                           TAHT ARE FLAGGED
2503                  MU      %F2,FILE,W        WRITE TRACK NO ADDRS      10  08021  M %F2 10891 W
2504                  BAI     STACHK            GO TO STATUS ERROR         7  08031  R 03D86 G M
2505                  CS      DATAFD&1          ROUTINE,RETURN HERE        6  08038  / 10901
2506                  MU      %F2,FILE,R        READ TRACK NO ADDRS       10  08044  M %F2 10891 R
2507                  BAI     STACHK            GO TO STATUS ERROR         7  08054  R 03D86 G M
2508                  SW      DATAFD                                       6  08061  , 10900
2509                  C       ALLBIT&7,DATAFD&1 CHECK DATA READ BACK      11  08067  C 10327 10901
2510                  BE      N20XIT            IF IT IS GOOD BRCH         7  08078  J 08091 S
2511                ***  SET ERROR 47 ON  ***
2512                  SW      E47               SET ERROR IND ON           6  08085  , 01848
2513          DATA READ DOES NOT COMPARE WITH DATA READ
2514     N20XIT       B       MONITR            GO TO MONITOR              7  0809?  J 02??1
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2516
2517                ***  TEST ROUTINE DESCRIPTION  ***
2518                ***  TEST SINGLE RECORD OP  ***
2519          THIS ROUTINE PERFORMS A SINGLE RECORD WRITE AND READ,USING THE
2520         RECORD ADDRESS WRITTEN IN ROUTINE N19.THE READ DATA IS COMPARED
2521         TO THE WRITE DATA AND IF IT DOES NOT COMPARE ERROR 48 IS
2522         INDICATED.ALL STATUS ERRORS ARE ALSO INDICATED.
2523
2524         FORMAT REQUIRED
2525         SAME AS WRITTEN BY ROUTINE N18
2526
2527         DATA FIELD USED
2528         *-
2529
2530       N21         NOP                                                   1  08098  N
2531                   DC      @21@              ROUTINE ID                  2  08100
2532                   CS      DATAFD&99         CLEAR DATA FIELD            6  08101  / 10999
2533                   MLCA    ALLBIT&5,FILE&7   LOAD ADDR                 12  08107  D 10325 10898 I
2534                   MRCWG   ALLBIT&6,DATAFD   LOAD DATA FIELD            12  08119  D 10326 10900 L
2535                   MU      %F1,FILE,W        WRITE SINGLE REC            10  08131  M %F1 10891 W
2536                   BAI     STACHK            GO TO STATUS ERROR          7  08141  R 03086 M
2537                   CS      DATAFD&1           ROUTINE,RETURN HERE        6  08148  / 10901
2538                   MU      %F1,FILE,R        READ SINGLE REC             10  08154  M %F1 10891 R
2539                   BAI     STACHK            GO TO STATUS ERROR          7  08164  R 03086 M
2540                   SW      DATAFD             ROUTINE RETURN HERE        6  08171  , 10900
2541                   C       ALLBIT&7,DATAFD&1 CHECK DATA READ BACK        11  08177  C 10327 10901
2542                   BE      N21XIT            IF IT IS GOOD BRCH          7  08188  J 08201 S
2543                ***  SET ERROR 48 ON  ***
2544                   SW      E48                                           6  08195  , 01849
2545        31141  DATA READ DOES NOT COMPARE TO DATA WRITTEN
2546       N21XIT      B       MONITR                                        7  08201  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2548
2549                ***  TEST ROUTINE DESCRIPTION  ***
2550                ***  TEST CYD OPERATION  ***
2551          IF CYD IS AVAILABLE A TRACK WITHOUT ADDR OP IS USED TO WRITE A
2552          2 CHAR RECORD ON EACH TRACK IN CYL 253,THE WRITTEN IS DO ON TRACK
2553          0,01 ON TRACK 1,AND SO ON THRU 39 ON TRACK 39.A READ CYD IS
2554          ISSUED,ADDRESSING THE BOTTOM TRACK ON CYL 253,AND THE DATA READ
2555          IS COMPARED TO THE 40 RECORDS WRITTEN.IF THE DATA READ DOES NOT
2556          COMPARE ERROR 49 IS INDICATED.THE 40 RECORDS ARE REWRITTEN USING
2557          A WRITE CYD AND THE PROGRAM BRANCHES BACK TO THE READ CYD.THE
2558          READ-WRITE CYD ARE REPEATED 10 TIMES.
2559
2560          FORMAT REQUIRED
2561          SAME AS WRITTEN BY ROUTINE N18
2562
2563          DATA FIELD ORGANIZATION
2564          40 2 CHARACTER RECORDS
2565
2566          DATA FIELD USED
2567          000102030405060708091011121314151617181920212223242526272829303 13
2568          233343536373839
2569     N22  NOP                                                           1  08208  N
2570          CC        @22@                                               2  08210
2571          B         TYP2              ROUTINE ID                       7  08211  J 01607
2572          CCW       @CYD@,G                                            3  08220
2573          CCW       @ @,G                                              1  08222
2574          BCE       *E8,*-13,1        BRCH IF CYC AVAIL                12  08224  B 08243 08222 1
2575          B         N22XIT                                             7  08236  J 08524
2576          S         TENCNT                                             6  08243  S 09991
2577          MRCG      CEADDR,FILE       LOAD ADDR                        12  08249  D 10342 10891 $
2578          CS        DATAFD&99         CLEAR DATA FIELD                 6  08261  / 10999
2579          MLCWA     @DC@,DATAFD&1     LOAD                             12  08267  D 10521 10901 X
2580          MLCWS     @M@,DATAFD&2          DATA FIELD                   12  08279  D 10487 10902 7
2581     TST22  MU      %F2,FILE,W        WRITE TRCK NO ADDRS              10  08291  M %F2 10891 W
2582          BCBI      *-16                                               7  08301  R 08291 2
2583          BAL       STACHK            BRCH ON ANY ERROR                7  08308  R 03086 M
2584          A         @1@,DATAFD&1      UPDATE RECORD                    11  08315  A 10489 10901
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  AODRS  INSTRUCTION
2585                A      @1@,FILE&5          UPDATE TRACK AOOR    11  08326  A 10489 10896
2586                BCE    *&8,FILE&4,6        BRCH IF CYL COML     12  08337  B 08356 10895 6
2587                B      TST22                                     7  08349  J 08291
2588                CS     DATAFD&99           CLEAR DATA FIELD      6  08356  / 10999
2589                MLCWS  @M@,DATAFD&80       SET TERMINATING WMGM 12  08362  D 10487 10980 7
2590                MRCG   CEAOOR,FILE         RELOAD FILE AODR     12  08374  D 10342 10891 $
2591      RDCYO     MU     %F@,FILE,R          READ CYO CYL 253     10  08386  M %F@ 10891 R
2592                SBR    DATA&4              STORE BAR AFTER READ  7  08396  G 01714 B
2593                BAL    STACHK              GO TO STATUS CHECK    7  08403  R 03086 M
2594                SW     DATAFO               ROUTINE,RETURN HERE  6  08410  , 10900
2595                C      CYCFLO,DATAFD&79    CHECK DATA READ      11  08416  C 10436 10979
2596                BE     PASS22              IF IT IS GOOD BRCH    7  08427  J 08464 S
2597               *** SET ERROR 49 ON ***
2598                SW     E49,EXTRA&1         SET ERROR IND ON     11  08434  , 01850 03005
2599          DATA READ DOES NOT COMPARE TO DATA WRITTEN
2600                MRCWG  BREG,DATA&7         MOVE MESSAGE         12  08445  D 09998 01717 L
2601                B      N22XIT                                    7  08457  J 08524
2602      PASS22    A      @1@,TENCNT          ADD 1 TO PASS COUNT  11  08464  A 10489 09991
2603                BZ     N22XIT              BRCH AFTER 10TH PASS  7  08475  J 08524 V
2604      WRTCYO    MLCA   CYCFLO,DATAFD&79    LOAD DATA FIELD      12  08482  D 10436 10979 T
2605                MU     %F@,FILE,W          WRITE CYO CYL 253    10  08494  M %F@ 10891 W
2606                BAL    STACHK              GO TO STATUS CHECK    7  08504  R 03086 M
2607                CS     DATAFD&79            ROUTINE RETURN HERE  6  08511  / 10979
2608                B      RDCYO                                     7  08517  J 08386
2609      N22XIT    B      MONITR                                    7  08524  J 02101
```

```
              ***  TEST ROUTINE DESCRIPTION  ***
              ***  TEST SEEK COMPLETE,BLOCK INTERUPT,& RELEASE  ***
           IF PRIORITY IS AVAILABLE A SEEK IS ISSUED AND ALERT MODE IS
          ENTERED.THE PROGRAM DELAYS AND IF NO INTERUPT OCCURES ERROR 51
          IS INDICATED.IF THE INTERUPT OCCURES A NO-OP IS ISSUED AND BUSY
          IS CHECKED,IF THE ACCESS IS STILL BUSY ERROR 52 IS INDICATED.IF
          THE 7631 IS A MODLE 3 A SEEK IS ISSUED FOLLOWED BY A SET BLOCK
          INTERUPT AND THE PROGRAM ENTERS ALERT MODE.A DELAY FOLLOWS DURING
          WHICH TIME NO INTERUPT SHOULD OCCURE,IF IT DOES ERROR 53 IS
          INDICATED.FINALLY A RELEASE INSTRUCTION IS ISSUED AND STATUS
          ERRORS ARE CHECKED.

N23       NCP                                                        1  08531  N
          CC     @23@                ROUTINE ID                      2  08533
          BCE    *&8,I264,1          BRCH IF PRIORITY               12  08534  B 08553 01264 1
          B      N23XIT                                              7  08546  J 08983
          B      TYP2                REQUEST MOD INFO                7  08553  J 01607
          DCW    @ENTER A 1 IF USING MOD 3 OR 5 7631@,G             34  08593
MODNUM    DCW    @ @,G                                               1  08595
          MLCA   @0C00@,FILE&5       LOAD ADDR                      12  08597  D 10506 10896 T
          MRCWG  PRITST,I08          SET UP INTERUPT LOC            12  08609  D 10438 00108 D L
          S      LNGCNT              RESET DELAY COUNTER             6  08621  S 10104
          SC     1,FILE              SEEK ACCESS                    10  08627  M %F0 10891 R
          BAI    *&I                                                 7  08637  R 08644 G M
          BEPA   *&I                 ENTER ALERT MODE                7  08644  Y 08651 E
DELAY5    A      31@,LNGCNT          WAIT                           11  08651  A 10489 10104
          C      LNGCNT,@3200@          FOR                         11  08662  C 10104 10548
          BE     *&8                       SEEK                      7  08673  J 08687 S
          B      DELAY5               COMPLETE INTERUPT              7  08680  J 08651
          BXPA   *&1                 EXIT ALERT MODE                 7  08687  Y 08694 X
       ***  SET ERROR 51 ON  ***
          SW     E51                 SET ERROR IND ON                6  08694  , 01852
   A SEEK DOES NOT CAUSE AN INTERUPT WHEN IT IS COMPLETE
          MRCWG  INTR,IC1            RESTORE INTERUPT LOC           12  08700  D C2007 00101 D L
          B      N23XIT                                              7  08712  J 08983
GOTINT    M      ‥C,FI‥,V             ‥O NO-‥                           087    M      10(   V
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PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2648                MRCWG  INTR,1C1          RESET INTERUPT LOC    12  08729  D 02007 00101 OL
2649                BA1    *&1                                      7  08741  R 08748 GM
2650                BCB1   *&8                CHECK BUSY            7  08748  R 08762 2
2651                B      PREVNT                                   7  08755  J 08775
2652                ***  SET ERROR 52 ON  ***
2653                SW     E52                SET ERROR IND ON      6  08762  , 01853
2654          A SEEK CAUSES AN INTERUPT WHEN IT IS COMPLETE,BUT A NO-OP INDI-
2655          CATES THE ACCESS IS STILL BUSY
2656                B      N23XIT                                   7  08768  J 08983
2657     PREVNT     BCE    *&8,MODNUM,1       BRCH IF MODLE 3 7631  12  08775  B 08794 08595 1
2658                B      N23XIT                                   7  08787  J 08983
2659                MRCWG  BLKTST,108         SET UP INTERUPT LOC   12  08794  D 10446 00108 DL
2660                MLCA   @9&20@,FILE&5      RESET FILE ADDRESS    12  08806  D 10552 10896 I
2661                SC     I,FILE             SEEK ACCESS           10  08818  M %F0 10891 RG
2662                BA1    *&1                                      7  08828  R 08835 GM
2663                MU     *F4,FILE,W         SET BLOCK INT         10  08835  M *F4 10891 W
2664                BA1    *&1                                      7  08845  R 08852 GM
2665                BEX1   STACHK,DL          BRCH ON ANY BUT N T   7  08852  R 03086 DL
2666                BEPA   *&1                  RETURN HERE         7  08859  Y 08866 E
2667                S      LNGCNT             RESET DELAY COUNT     6  08866  S 10104
2668     DELAY6     A      @1@,LNGCNT         WAIT FOR              11  08872  A 10489 101D4
2669                C      LNGCNT,@32000      POSSIBLE ERRONEOUS    11  08883  C 10104 10548
2670                BE     *&8                INTERUPT              7  08894  J 08908 S
2671                B      DELAY6                                   7  08901  J 08872
2672                BXPA   *&1                EXIT ALERT MODE       7  08908  Y 08915 X
2673                B      RELESE                                   7  08915  J 08947
2674                ***  SET ERROR 53 ON  ***
2675     BADINT     SW     E53                SET ERROR IND ON      6  08922  , 01854
2676          A SEEK OP FOLLOWED BY A SET BLOCK INTERUPT DOES NOT BLOCK INTERPT
2677                MRCWG  INTR,1C1           RESET INTERUPT LOC    12  08928  D 02007 00101 DL
2678                B      N23XIT                                   7  08940  J 08983
2679     RELESE     MRCWG  INTR,1C1           RESET INTERUPT LOC    12  08947  D 02007 00101 DL
2680                MU     %F9,FILE,W         RELEASE 7631          10  08959  M %F9 10891 W
2681                BA1    *&1                                      7  08969  R 08976 GM
2682                BEX1   STACHK,DL          BRCH ON ANY BUT N T   7  08976  R 03086 DL
2683     N23XIT     B      MONITR               ROUTINE,RETURN      7  08983  J 02101
```

```
PGLIN    LABEL     OPCOD  OPERANC                                          CT  ADDRS  INSTRUCTION

2685
2686                ***  TEST ROUTINE DESCRIPTION  ***
2687                ***  TEST WRITE INHIBIT,HAO,WRITE FORMAT SWITCHES  ***
2688          THIS IS RUN ONLY IN THE MANUAL MODE,IT BEGINS BY REQUESTING THAT
2689          THE HAC,AND WRITE FORMAT SWITCHES BE TURNED OFF.WITH THESE
2690          SWITCHES OFF A WRITE HAO IS ISSUED AND NOT READY IS CHECKED,IF IT
2691          IS NOT ON ERROR 54 IS INDICATED.A WRITE FORMAT WITH WDC OP IS
2692          ISSUED AND EXT COND IS CHECKED,IF IT IS NOT ON ERROR 55 IS INDI-
2693          CATED.THE ROUTINE REQUESTS THAT THE HAO AND WRITE INHIBIT
2694          SWITCHES BE TURNED ON.A WRITE OP TRYS TO RE-WRITE A RECORD AND
2695          READ IT BACK,IF THE RECORD IS WRITTEN ERROR 56 IS INDICATED.
2696
2697          RECORD USED WHEN ATTEMPTING HAO WRITE -HAO SWITCH OFF-
2698          88123456+-
2699
2700          FORMAT USED WHEN ATTEMPTING WRITE FORMAT  -WRT FMT SWITCH OFF-
2701          444444333333333333433333333333341111111112
2702
2703          RECORD USED WHEN ATTEMPTING WRITE  -WRITE INHIBIT SWITCH ON-
2704          99
2705
2706     N24        NOP                                                     1  08990  N
2707                CC     @24@                                             2  08992
2708                BCE    *&8,SPTAD1,1       BRCH IF MANUAL MODE          12  08993  B 09012 01005 1
2709                B      N24XIT                                          7  09005  J 09344
2710                B      TYPI                                            7  09012  J 01593
2711                OCW    @HAO&WRT FMT SWS OFF@,G                        19  09037
2712                H                         WAIT FOR ACTION              1  09039  .
2713                MRCWG  CEAOOR,FILE        LOAD FILE ADDR              12  09040  D 10342 10891 D L
2714                MLCA   @88@,DATAFD&1      LOAD                        12  09052  D 10554 10901 I
2715                MRCWG  ALLBIT,DATAFD&2        DATA FIELD              12  09064  D 10320 10902 C L
2716                SC     1,FILE             POSITION ACCESS             10  09076  M %F0 10891 R
2717                BCB1   *-16                                             7  09086  R 09076 2
2718                BA1    *&1                                              7  09093  R 09100 G M
2719                MU     %F5,FILE,W         WRITE HAO                   10  09100  M %F5 10891 W
2720                BCB1   *-16                                             7  09110  R 09100 2
2721                BA1    *&1                                              7  09117  R 09124 G M
```

```
PGLIN     LABEL      OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2722                 BNR1   *&7                 CHECK FOR NOT RDY     7  09124  R 09137 1
2723                ***  SET ERROR 54 ON  ***
2724                 SW     E54                 SET ERROR IND ON      6  09131  , 01855
2725       WRITE HAD CAN BE PERFORMED WITH HAD SWITCH OFF
2726                 CS     DATAFD&99           CLEAR DATA FIELD      6  09137  / 10999
2727                 SW     DATAFD                                    6  09143  , 10900
2728                 MRCG   HA1-32,DATAFD       LOAD                 12  09149  D 10142 10900 $
2729                 MRCWG  RECADR-1,DATAFC&30      FORMAT           12  09161  D 10235 10930 L
2730                 MU     %F7,FILE,W            WRITE FORMAT       10  09173  M %F7 10891 W
2731                 BCB1   *-16                                      7  09183  R 09173 2
2732                 BA1    *&1                                       7  09190  R 09197 M
2733                 BEF1   *&7                 BRCH ON EXT COND      7  09197  R 09210 8
2734                ***  SET ERROR 55 ON  ***
2735                 SW     E55                 SET ERROR IND ON      6  09204  , 01856
2736       WRITE FORMAT CAN BE PERFORMED WITH WRITE FORMAT SWITCH OFF
2737                 B      TYP1                                      7  09210  J 01593
2738                 DCW    @WRITE INHIBIT&HAD SWS ON@,G             24  09240
2739                 H                          WAIT FOR ACTION       1  09242  .
2740                 CS     DATAFD&99           CLEAR DATA FIELD      6  09243  / 10999
2741                 MLCA   @99@,DATAFD&1       LOAD                 12  09249  D 10556 10901 T
2742                 MLCWS  @M@,DATAFD&2            DATA FIELD       12  09261  D 10487 10902 7
2743                 MU     %F2,FILE,W          WRITE TRCK NO ADDRS   10  09273  M %F2 10891 W
2744                 BA1    *&1                                       7  09283  R 09290 M
2745                 CS     DATAFD&1            CLEAR DATA FIELD      6  09290  / 10901
2746                 MU     %F2,FILE,R          READ TRACK NO ADDRS   10  09296  M %F2 10891 R
2747                 BA1    *&1                                       7  09306  R 09313 M
2748                 C      DATAFD&1,@99@       CHECK DATA READ       11  09313  C 10901 10556
2749                 BE     *&6                 IT SHOULD NOT COMP     7  09324  J 09338 S
2750                 B      N24XIT                                    7  09331  J 09344
2751                ***  SET ERROR 56 ON  ***
2752                 SW     E56                 SET ERROR IND ON      6  09338  , 01857
2753       WRITE TRACK WITHOUT ADDR CAN BE PERFORMED WITH WRITE INHIBIT
2754       SWITCH ON
2755     N24XIT       B      MONITR                                    7  09344  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERANC                                          CT  ADDRS  INSTRUCTION

2757
2758                ***  TEST ROUTINE DESCRIPTION  ***
2759                ***  RESTORE FLAGGED TRACKS ON DIAGNOSTIC CYL 253  ***
2760          THIS ROUTINE RESTORES THE HOME ADDRESSES ON THE TRACKS USED  IN
2761           THE FLAGGING ROUTINES N16 & N17.
2762      N25       NOP .                                                    1  09351  N
2763                DC      @25@              ROUTINE ID                     2  09353
2764                CS      DATAFO&99         CLEAR DATAFLD                  6  09354  / 10999
2765                MRCWG   CEADDR,FILE       RESET ADDR                    12  09360  D 10342 10891 DLL
2766                MRCWG   FILE&2,DATAFO     LOAD ADDR INTO                12  09372  D 10893 10900 DL
2767                MRCWG   FILE&7              DATA FIELD                   6  09384  D 10898
2768                SC      1,FILE            POSITION ACCESS               10  09390  M %F0 10891 R
2769                BCB1    *-16                                            7  09400  R 09390 2
2770                BA1     *&1                                             7  09407  R 09414 MG
2771                B       TYP1                                            7  09414  J 01593
2772                DCW     @WRT INHIBIT OFF,HAD&CE-HAD SNS ON@,G           33 09453
2773                H                         WAIT FOR CE ACTION            1  09455  .
2774      REMOVE    MU      %F5,FILE,W        WRITE HAD                     10  09456  M %F5 10891 W
2775                BCB1    *-16                                            7  09466  R 09456 2
2776                BA1     *&1                                             7  09473  R 09480 MG
2777                BEX1    STACHK,MS         CHECK ALL BUT WLR             7  09480  R 03086 MS
2778                SW      FILE&4              RETURN HERE                  6  09487  , 10895
2779                A       @1@,FILE&5        UPDATE FILE ADDR              11 09493  A 10489 10896
2780                MRCG    FILE&2,DATAFO     MOVE ADDR TO DATA FD          12 09504  D 10893 10900 $
2781                BCE     N25XIT,FILE&5,6   BRCH IF ALL FLAGS             12 09516  B 09535 10896 6
2782                B       REMOVE             REMOVED                      7  09528  J 09456
2783      N25XIT    B       MONITR                                          7  09535  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2785
2786                ***  TEST ROUTINE DESCRIPTION  ***
2787                ***  LOCATE CHANNELS THAT HAVE 7631 ADAPTERS  ***
2788          THIS ROUTINE USES THE INFORMATION ON THE CHANNEL CARDS TO
2789        LOCATE AVAILABLE 7631.THE ROUTINE CAUSES THE PROGRAM TO BE
2790        INITIALIZED ACCORDING TO THE CHANNEL LOCATED.WHEN ALL CHANNELS
2791        HAVE BEEN CHECKED THE ROUTINE ENDS THE PROGRAM.
2792      N26         NOP                                                   1  09542  N
2793                  DC      @26@                                          2  09544
2794      UPIX15      A       @57@,X15          UPDATE IX 15               11  09545  A 10558 00099
2795                  A       @3@,X14                                      11  09556  A 10495 00094
2796                  BCE     ENDTST,X15,M      BRCH IF ALL CHANNELS TRIED 12  09567  B 09896 00099 QM
2797                  BCE     *&8,0&X15,F       BRCH IF FILES ON THIS CHANNEL 12  09579  B 09598 00MMO QQ F
2798                  B       UPIX15                                       7  09591  J 09545
2799                  MLCA    CODE3&X14,TSTCH                              12  09598  D 10DN6 09629 I
2800                  B       CHALTR                                       7  09610  J 01046
2801                  DCW     TOP               TOP LIMIT                  5  09621  09642
2802                  DC      BOTTOM-1          LO LIMIT                   5  09626  03542
2803                  DCW     @ @                                          1  09627
2804                  DC      @ @                                          1  09628
2805      TSTCH       DC      @ @                                          1  09629
2806                  MLCS    TSTCH,CHLMES&7    MOVE CHANNEL #             12  09630  D 09629 09656 3
2807      TOP         B       TYP2                                         7  09642  J 01607
2808       CHLMES     DCW     @TST CHL  ,ENTER 2 DIGIT ACC&MOD ADDR TO BE USED@ 47  09649
2809                  DC      @,ENTER 99 IF NO TEST ON THIS CHANNEL@,G     36  09731
2810                  DCW     @  @,G                                       2  09734
2811                  MLCA    *-13,CEADDR&1     MOVE ADDR SELECTED         12  09736  D 09734 10343 I
2812                  MRCG    CEADDR,FILE                                  12  09748  D 10342 10891 $
2813                  C       CEADDR&1,@99@     CHECK FOR NO TEST          11  09760  C 10343 10556
2814                  BE      UPIX15            BRCH IF NO TEST            7  09771  J 09545 S
2815                  B       TYP2                                         7  09778  J 01607
2816                  DCW     @HAO,CE-HAO,CE-WRT ON FOR THIS CHL 7631.WRT FMT ON@ 49  09833
2817                  DC      @ FOR SLTD ACC&MOD,SELECT MODE@,G            29  09862
2818                  DCW     @ @,G                                        1  09864
2819                  MLCS    *-13,SPTAD1       MOVE MODE                  12  09866  D 09864 01005 3
2820                  ZA      &NC1,X3           LOAD IX 3                  11  09878  QM 10563 00039
2821                  B       NO1               GO TEST CHANNEL            7  09889  J 03476
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
2822      ENDTST    B      TYP1                                              7  09896  J 01593
2823                DCW    @PASS,INSURE ALL 1302/7631 SWS ARE OFF,RESET ALL @ 48  09950
2824                DC     @INOP LATCHES@,G                                 12  09962
2825                H                                                        1  09964  .
2826                BCE    2000,TAD3,1        BRCH IF REPEATING             12  09965  B 02000 01003 1
2827                B      400                                               7  09977  J 00400
2828      PREP      B      PRGCTL             ONE INSTRUCTION LOOP           7  09984  J 02273
2829                       NOT AVILABLE RETURN TO SELECT ANCTHER OPT
```

```
PGLIN     LABEL     OPCOD  OPERAND                                                    CT  ADDRS  INSTRUCTION
2831      TENCNT    DCW    @0@                                                         1  09991
2832       EREG     DCW    @E REG@,G                                                   5  09992
2833       BREG     DCW    @B REG@,G                                                   5  09998
2834      BRCH0     B      RESET1                                                      7  10004  J 03519
2835                DCW    @M@                                                         1  10011
2836      BRCH1     B      HANG1                                                       7  10012  J 03662
2837                DCW    @M@                                                         1  10019
2838      ZERO      DCW    @000000@                                                    6  10025
2839       ALLCHR   DCW    @ .¤BTHC$*B;L-/,%SSMB#@.TMMABCDEFGHI'JKLMNOPQR*STUV@      50  10026
2840                DC     @WXYZ0567891234@,G                                         14  10089
2841       ACCMES   DC     @ACCR FLO@,G                                                8  10091
2842      LNGCNT    DCW    @000000@                                                    5  10104
2843      BRCH2     B      HANG2                                                       7  10105  J 05494
2844                DCW    @M@                                                         1  10112
2845      CCN1      DCW    0A1AF0641                                                   5  10117  10941
2846      BRCH3     B      HANG3                                                       7  10118  J 05946
2847                DCW    @M@                                                         1  10125
2848       CHRMES   DCW    @ILLGL CHAR@,G                                             10  10126
2849      CCN2      DCW    0ATAFD638                                                   5  10141  10938
2850      HA1       DCW    @4444443333333333343333333333334@                         33  10174
2851      HA2       DC     @1111111111@                                               9  10183
2852      LONGAP    DCW    @2222222222222222@                                        15  10198
2853      RECADR    DC     @1111111111111211111111111112111111112@,G                 38  10236
2854       TSTFMT   DCW    @444444333333333333333333333333333333334@,G               40  10238
2855       TSTFT6   DCW    @444444111111111111111111111111111111112@,G               40  10279
2856       ALLBIT   DCW    @123456B-@,G                                               8  10320
2857      BRCH4     B      HANG4                                                       7  10329  J 06720
2858                DCW    @M@                                                         1  10336
2859      CCN3      DCW    0ATAFD616                                                   5  10341  10916
2860       CEADDR   DCW    @009#2088@,G                                               8  10342
2861       FLAGS    DCW    @124567@                                                   6  10351
2862                DCW    @000102030405060708091011121314151617181920212223240@    50  10406
2863      CYCFLD    DC     @252627282930313233343536373839@,G                        30  10436
2864      PRITST    B      GOTINT                                                      7  10438  J 08719
2865                DCW    @M@                                                         1  10445
2866      BLKTST    B      BADINT                                                      7  10446  J 08922
2867                DCW    @M@                                                         1  10453
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2868	CODE3	DCW	@ @	3	10456	
2869		DCW	@%R1@	3	10459	
2870		DCW	@¤X2@	3	10462	
2871		DCW	@Q M33@	3	10465	
2872		DCW	@'14@	3	10468	
2873	CVRLAP	DCW	@ @	3	10471	
2874			@@@@@	3	10474	
2875			@***@	3	10477	
2876			@$$$@	3	10480	
2877			@###@	3	10483	
2878		LTORG			10484	
2878			@N@	1	10484	
2878			@+@	1	10485	
2878			@D L@	1	10486	
2878			@G M@	1	10487	
2878			@ @	1	10488	
2878			@1@	1	10489	
2878			@00209@	5	10494	
2878			@3@	1	10495	
2878			@7@	1	10496	
2878			@0C237@	5	10501	
2878			@2@	1	10502	
2878			@0000@	4	10506	
2878			@1275@	4	10510	
2878			@3C@	2	10512	
2878			N26	5	10517	09542
2878			@6C@	2	10519	
2878			@0C@	2	10521	
2878			@20@	2	10523	
2878			@4400@	4	10527	
2878			@7760@	4	10531	
2878			@11@	2	10533	
2878			@21@	2	10535	
2878			@4@	1	10536	
2878			@888@	3	10539	
2878			@888A@	4	10543	
2878			@6@	1	10544	
2878			@3200@	4	10548	

DC03 PROGRAM CONSTANTS

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2878			@9#20@			
2878			@88@			
2878			@99@			
2878			@57@			
2878			NO1			
2879		ORG	10891			
2880	FILE	DCW	@0C9#2088@,G	4	10552	
2881	DATAFD	DCW	@ @	2	10554	
2882		DS	98	2	10556	
2883		LOAD		2	10558	
2884		END	2000	5	10563	03476
					10891	
				8	10891	
				1	10900	
					10998	

J02000

END OF ASSEMBLY

6.25.00.0 DC04 MECHANICAL AND HYDRAULIC TEST DESCRIPTION

This test uses an oil warm-up routine before beginning the testing of the access.

The program tests every available access on every channel in an automatic or manual mode. The automatic mode requires no manual intervention and can be run from a Load-and-Go maintenance tape. The manual mode does require intervention and cannot be run unattended.

The program starts by running a five-minute oil warm-up routine; if in manual mode, an additional 20 minutes is run. Making of the inner and outer CE switches is checked, and the time to move from the rezore position to cylinder 000 checks the action of the detent.
Ten passes through maximum movement seek routine are made, followed by 100 passes through a random seek test. The program now times four seeks with the access being moved from the outside portion of the disk inward to the center. The time to return from the inner position of the disk outward toward the edge of the disk is also checked. The seeks are repeated 10 Times, the average, the times are printed on the console and the next available module is tested.

6.25.01.0 OPERATING PROCEDURE

The standard procedures outlined in the package write-up apply to this program. In addition, the following procedures are used to run this program.

01.1 SWITCH SETTINGS PREVIOUS TO RUNNING PROGRAM

A. Write HAO switch on (on all 7631's to be tested).

B. *Write Inhibit switch on (on all 7631's to be tested).

C. All 1301 modules not to be tested are set inoperative.

*NOTE: Write Inhibit switch need only be turned on when running in manual mode.

01.2 SPECIAL REQUESTS(MADE ONLY IN THE MANUAL MODE)

A. "CE-HAO ON"

CE turns on CE HAO switch and presses start. This request is made if during the random seek test the access fails to position correctly. With the CE-HAO switch on, the HA1 is read into memory and displayed on the typewriter.

6.25.01.0 OPERATING PROCEDURE (continued)

B. "ADDR READ, 0000000, CE-HAO OFF"

The CE turns off the CE-HAO switch and presses start to continue.

01.3 SPECIAL OPTION

There is one special option for this program (option code 8) IF THIS option is selected the program will run the seek routines that allow the CE to select a to and from address to be timed. An average time is typed out every 100 seeks. The routine is exited by pressing request and selecting the continue option.

01.4 STANDARD OPTIONS

Two of the standard options are not available with this program, they are:

A. Alter Routine Sequence - option code 3

B. One Instruction Loop - option code 5

01.5 SPECIAL TADS

There is one special tad (Memory Loc. 1004) which selects the manual mode when it is set to 1. This tad is set to $\overline{1}$ when the program is loaded.

01.6 MANUAL MODE

When the manual mode has been selected, the program:

A. Runs the oil warm-up routine for a total of 25 minutes.

B. Requests intervention when access fails to position correctly in the random seek test.

01.7 SUMMARY TYPEOUT

The summary of errors typeout is not available with this program.

6.25.02.0 OPERATING HINTS

02.1 SELECTING MANUAL MODE (ALTER SPECIAL TAD)

Use program option code 2 (alter memory) to alter special TAD 1 to a 1 or $\overline{1}$. Manual mode should normally be selected during the first five minute warm-up period. Special TAD memory location 01004.

02.2 SELECTING OPTION 8 (Select Seek Addresses)

Use normal procedure for selecting control options enter "8". Program will request that to and from addresses be entered.* Program will seek between addresses entered, giving average seek time every 100 seeks. Press inq request and select code "7" to continue with program.

* NOTE: When entering the to and from addresses, two 8 digit addresses must be entered; the access, module, track addresses & HA 2 are all required.

02.3 POWER ON WARM-UP

If power has just been brought up, the additional 20 minute warm-up must be run for valid results. To run the extra 20 minute warm-up, select manual mode during the first five minute warm-up.

6.25.03.0 PROGRAM STOPS

03.1 ERROR STOPS

None.

03.2 NORMAL STOPS (MANUAL MODE ONLY)

Memory Loc.	Reason
04692	Wait for CE to turn on CE-HAO switch and press start.
04769	Wait for CE to turn off CE-HAO switch and press start.

6.25.04.0 TYPEOUTS (OTHER THAN REQUEST OR STANDARD TYPEOUTS)

04.1 "AUTO MODE, HAO SWITCH ON"

This is to remind the CE that this program runs in automatic mode when loaded and that the HAO switch on the 7631 must be on.

04.2 "TST MODE 0 ACC 0 CH0"

This tells the CE which module and access on which channel is being tested at present.

6.25.04.0 TYPEOUTS (continued)

04.3 "BEGINNING 5 MINUTE WARM-UP"

"BEGINNING 20 MINUTE WARM-UP"

"WARM-UP COMPLETE TEST BEGINNING"

These typeouts are simply reference points to let the CE know where he is at.

NOTE: The 20 minute message is given only when running in manual mode.

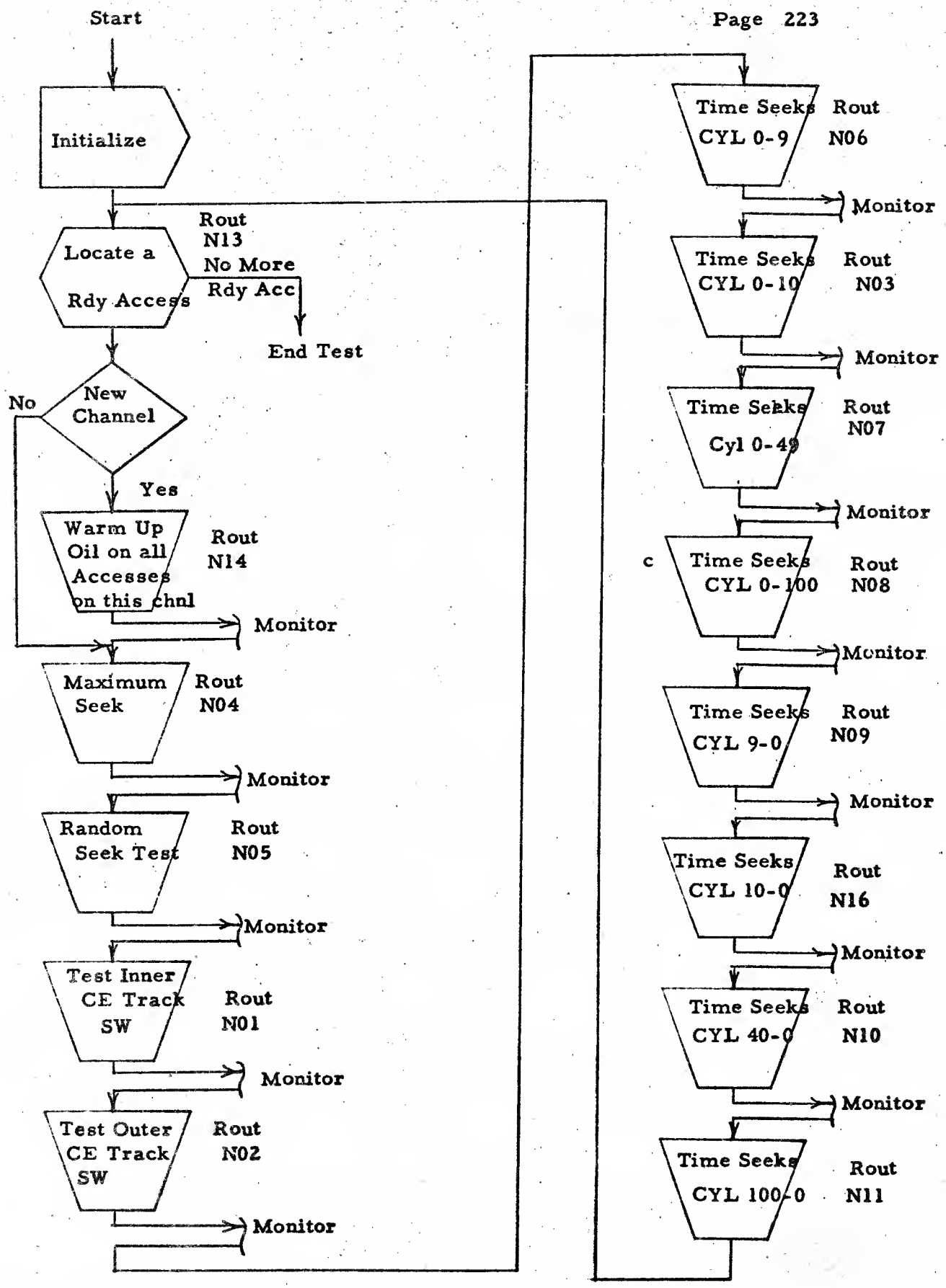
04.4 Seek time results are typed in the following table after all the timings have been made.

Seek - From	To	Time - Was	Should be	In MSEC
0000	0360		50	
0000	0400		120	
0000	1600		120	
0000	4000		180	
0360	0000		50	
0400	0000		120	
1600	0000		120	
4000	0000		180	

04.5 Results of timing access motion from rezero to Cyl 000 is typed as follows: " SEEK TIME FROM REZERO TO CYLO IS , IT SHOULD BE MSEC"

6.25.05.0 **FLOW CHART**

The following flow chart is designed to give a general picture of the test routine's relationship to one another.


Start
Initialize
Locate a Rdy Access
Rout N13
No More Rdy Acc
End Test
No
New Channel
Yes
Warm Up Oil on all Accesses on this chnl
Rout N14
Monitor
Maximum Seek
Rout N04
Monitor
Random Seek Test
Rout N05
Monitor
Test Inner CE Track SW
Rout N01
Monitor
Test Outer CE Track SW
Rout N02
Monitor
Time Seeks CYL 0-9
Rout N06
Monitor
Time Seeks CYL 0-10
Rout N03
Monitor
Time Seeks Cyl 0-49
Rout N07
Monitor
c
Time Seeks CYL 0-100
Rout N08
Monitor
Time Seeks CYL 9-0
Rout N09
Monitor
Time Seeks CYL 10-0
Rout N16
Monitor
Time Seeks CYL 40-0
Rout N10
Monitor
Time Seeks CYL 100-0
Rout N11

6.25.06.0 ROUTINE/ERROR INDEX DC04

This index should be used to locate routines and errors in the program listing.

```
PGLEN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1002                LOAD
1003                CTL    2
1004
1005                DEFINE STANDARD TADS          **
1006
1007                ORG    1000                     **           01000
1008      TAD0      DCW    a a                                1  01000
1009      TAD1             a a                                1  01001
1010      TAD2             a a                                1  01002
1011      TAD3      DCW    a a                                1  01003
1012                                               **
1013                DEFINE SPECIAL TADS
1014                                               **
1015      SPTAD0    DCW    a a                                1  01004
1016      SPTAD1           a a                                1  01005
1017      SPTAD2           a a                                1  01006
1018      SPTAD3           a a                                1  01007
1019      SPTAD4           a a                                1  01008
1020      SPTAD5           a a                                1  01009
1021      SPTAD7           a a                                1  01010
1022      SPTAD8           a a                                1  01011
1023      SPTAD9           a a                                1  01012
1024
```

```
PGLIN     LABEL     OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION

1026                  *** I/C DICOST PROGRAM ***
1027                *** ONE INSTRUCTION LOOP ROUTINE ***
1028          WHEN THE CE SELECTS A ONE INSTRUCTION LOOP THE I/O INSTRUCTION
1029          IN THIS ROUTINE IS ALTERED AND THE LOOP IS ENTERED.NOTE THAT THE
1030          BRANCH ON INQUIRY INSTRUCTION IS THE ONLY EXIT FROM THE LOOP.
1031      LOOP      MU     %11,0,R          I/O INST BEING LUP D       10  01013  M %11 00000 R
1032                BAI    *&1                                         7  01023  R 01030 M
1033                BNQ    PRGCTL           BRCH ON INQ TO PRGCL       7  01030  J 02273 Q
1034                B      LOOP             CONTINUE TO LOOP           7  01037  J 01013
1035                H                                                  1  01044  .
1036
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1038                       *** I/C DICOST PROGRAM ***
1039                    *** CHANNEL ALTER ROUTINE ***
1040          THIS ROUTINE ALTERS ALL I/C INSTRUCTIONS,BRANCH-ON-STATUS-
1041        INDICATOR-ON INSTRUCTIONS,AND BRANCH ON CHANNEL OVERLAP IN PRO-
1042        CESS INSTRUCTIONS ACCORDING TO THE CHANNEL INDICATED.THIS IS DONE
1043        BY SCANNING A DEFINED AREA OF MEMORY AND ALTERING THESE INSTRUC-
1044        TIONS.
1045
1046      CHALTR    SBR    X5               STORE ADDR                        7  01045  G 00049 B
1047                MLCA   9&X5,X7          LOAD IX6 & IX7                   12  01052  D 00*#9 00059 I
1048      SCAN      SCNLA  0&X6,0&X6        SCAN FOR WM                      12  01064  D 00*.0 00*.0 S B
1049                SAR    X6               STORE ADDR OF OPER                7  01076  G 00054 A
1050                C      X6,X7            HAS ALL OF FLD BEEN              11  01083  C 00054 00059
1051                BH     13&X5            SEARCHED IF SO BRCH               7  01094  J 00*/3 U
1052                MLCS   1&X6,*&12        STORE OP CODE                    12  01101  D 00*.1 01124 3
1053                BCE    MLCRU,CODES,     IS OP CODE M                     12  01113  B 01149 02604
1054                BCE                     IS OP CODE L                      1  01125  B
1055                BCE                     IS OP COOE U                      1  01126  B
1056                BCE    RX3OR1           IS OP COOE R                      6  01127  B 01168
1057                BCE                     IS OP COOE X                      1  01133  B
1058                BCE                     IS OP CODE 3                      1  01134  B
1059                BCE                     IS OP CODE 1                      1  01135  B
1060                BCE    JAY              IS OP CODE J                      6  01136  B 01187
1061                B      SCAN             GO FIND NEXT OPER                 7  01142  J 01064
1062      MLCRU     MLCS   10&X5,2&X6       CHEANGE CH-MODE CHAR             12  01149  D 00*/0 00*.2 3
1063                B      SCAN             GO FIND NEXT OPER                 7  01161  J 01064
1064      RX3OR1    MLCS   11&X5,1&X6       CHANGE B-1-S-I-O OP              12  01168  D 00*/1 00*.1 3
1065                B      SCAN             GO FIND NEXT OPER                 7  01180  J 01064
1066      JAY       MLCS   7&X6,*&12        STORE MODIFIER                   12  01187  D 00*.7 01210 3
1067                BCE    ONE234,MCOS,     IS MODIFIER A 1                  12  01199  B 01221 02608
1068                BCE                     IS MODIFIER A 2                   1  01211  B
1069                BCE                     IS MODIFIER A 3                   1  01212  B
1070                BCE                     IS MODIFIER A 4                   1  01213  B
1071                B      SCAN             GO FIND NEXT OPER                 7  01214  J 01064
1072      ONE234    MLCS   12&X5,7&X6       CHANGE BOL MODIFIER              12  01221  D 00*/2 00*.7 3
1073                B      SCAN             GO FIND NEXT OPER                 7  01233  J 01064
1074                H                                                        1  01240  .
```

PGLIN	LABEL	OPCOD	OPERAND			CT	ADDRS	INSTRUCTION
1078								
1079								
1080			DEFINE SYSTEM & CHANNEL CONTROL CARDS					
1081								
1082			ORG 1233				01233	
1083			DCW @FP6FMLFMTFMC383@@3			17	01249	
1084				**				
1085			DEFINE PROGRAM TITLE					
1086				**				
1087			ORG 1250				01250	
1088			DCW @DC04@@,6			5	01254	
1089								
1090			LOCATE THE SYSTEM & CHANNEL CARDS					
1091								
1092			ORG 1256				01256	
1093	SYSTEM		DC @		@	50	01256	
1094			@	@		7	01312	
1095			ORG 1289				01289	
1096	CHNL1		DC @		@	50	01289	
1097			@	@		7	01345	
1098			ORG 1346				01346	
1099	CH...2		DC @		@	50	01346	
1100			@	@		7	01402	
1101			ORG 14C3				01403	
1102	CHNL3		DC @		@	50	01403	
1103			@	@		7	01459	
1104			ORG 1460				01460	
1105	CHNL4		DC @		@	50	01460	
1106			@	@		7	01516	
1107								

```
PGLIN   LABEL   OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1106                      *** I/C DICOST PROGRAM ***
1107                    *** TYPE AND REQUEST FOR INTERVENTION ***
1108            THIS ROUTINE IS USED TO TYPE ALL MESSAGES AND REQUESTS FOR
1109          MANUAL INTERVENTION.THE ROUTINE WILL TYPE A MESSAGE FROM A COMMON
1110          DATA FIELD,OR THE MESSAGE MAY BE LOCATED IMMEDIATELY AFTER THE
1111          BRANCH INSTRUCTION TO THIS ROUTINE.IF A REPLY IS REQUIRED A READ
1112          CONSOLE PRINTER OPERATION IS ISSUED.THIS ROUTINE IS USED TO TYPE
1113          ALL MESSAGES IN THIS PROGRAM.
1114
1115    TYMES   SBR     TYPXIT&5        STORE RETURN ADDR          7  01517  G 01591 B
1116    TYPE    WCP     201             TYPE MESSAGE              10  01524  M %TO 00201 W
1117            BEX1    TYPE,M S        BRCH ON ANY BUT WLR        7  01534  R 01524 SMG
1118            BA1     *&1                                        7  01541  R 01548 M
1119    SW11    NOPWM                                              1  01548  N
1120    LA866   RCP     0               READ CONSOLE PRINTER      10  01549  M %TO 00000 R
1121            BEX1    *-16,M S        BRCH ON ANY BUT WLR        7  01559  R 01549 SMG
1122            BA1     *&1                                        7  01566  R 01573 M
1123            CW      SW11&1          TURN OFF SWITCH 11         6  01573  ¤ 01549
1124            CS      330             CLEAR PRINT AREA           6  01579  / 00330
1125            CS                                                 1  01585  /
1126    TYPXIT  B       0               RETURN TO DICOST           7  01586  J 00000
1127    TYP1    SBR     X1              STORE ADDR OF MESG         7  01593  G 00029 B
1128            B       *&14                                       7  01600  J 01620
1129    TYP2    SBR     X1              STORE ADDR OF MESG         7  01607  G 00029 B
1130            SW      REPLY&1         TURN ON REPLY SW           6  01614  , 01652
1131            WCP     0&X1            TYPE MESSAGE              10  01620  M %TO 000*0 W
1132            SBR     X5              SAVE AODR                  7  01630  G 00049 B
1133            BEX1    *-23,M S        BRCH ON ANY BUT WLR        7  01637  R 01620 SMG
1134            BA1     *&1                                        7  01644  R 01651 M
1135    REPLY   NOPWM                   BRCH                       1  01651  N
1136            B       RDCON           IF REPLY REQUIRED          7  01652  J 01666
1137            B       0&X5            RETURN                     7  01659  J 00**0
1138    RDCON   RCP     0&X5            REPLY TO MESSAGE          10  01666  M %TO 00**0 R
1139            SBR     X1              SAVE AODR                  7  01676  G 00029 B
1140            BEX1    *-23,M S        BRCH ON ANY BUT WLR        7  01683  R 01666 SMG
1141            BA1     *&1                                        7  01690  R 01697 M
1142            CW      REPLY&1                                    6  01697  ¤ 01652
```

```
PGLIN  LABEL   OPCOD  OPERAND                  COMMENTS                          CT  ADDRS  INSTRUCTION
1143           B      0&X1                     RETURN                             7  01703  J 00040
1144   DATA    MLCNS  &N&.PASS1                RESET FIRST PASS INST             12  01710  D 08712 01944 7
1145           BCE    *&13,1264,1              BRCH IF PRIORITY AVAILABLE        12  01722  B 01746 01264 1
1146           MLCNS  &N&,NONITR67             ALTER PRIORITY INST TO NO-OP      12  01734  D 08712 02108 7
1147           MRCWG  *&9,1230                 RESTORE CHANNEL ALTER ROUTINE     12  01746  D 01766 01230 0
1148           B      PASS1&7                                                     7  01758  J 01951
1149           M                                                                  1  01765  .
1150           DC     &.736                                                       3  01768
1151           DCW    &J&                                                         1  01769
1152           DC     SCAN                                                        5  01774  01064
1153           DC     & &                                                         1  01775
1154           DCW    &.&.G                                                       1  01776
1155           DS     12                                                             01789
1156
1157                  *** ERROR TABLES THESE ARE USED FOR ERROR ***
1158                  *** SUMMARIES AND ERROR INDENTIFICATION ***
1159
1160           ORG    *&X00                                                          01800
1161           ORG    *&1                                                            01801
1162   STPTAB  DCW    &L&                                                         1  01801
1163    E1     DC     & &                                                         1  01802
1164    E2            & &                                                         1  01803
1165    E3            & &                                                         1  01804
1166    E4            & &                                                         1  01805
1167    E5            & &                                                         1  01806
1168    E6            & &                                                         1  01807
1169    E7            & &                                                         1  01808
1170    E8            & &                                                         1  01809
1171    E9            & &                                                         1  01810
1172    E10           & &                                                         1  01811
1173    E11           & &                                                         1  01812
1174    E12           & &                                                         1  01813
1175    E13           & &                                                         1  01814
1176    E14           & &                                                         1  01815
1177    E15    DC     & &                                                         1  01816
1178    E16           & &                                                         1  01817
1179    E17           & &                                                         1  01818
1180    E18           & &                                                         1  01819
```

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1181	E19		A A	1	01820	
1182	E20		A A	1	01821	
1183	E21		A A	1	01822	
1184	E22		A A	1	01823	
1185	E23		A A	1	01824	
1186	E24		A A	1	01825	
1187	E25	DC	A A	1	01826	
1188	E26	DC	A A	1	01827	
1189	E27		A A	1	01828	
1190	E28		A A	1	01829	
1191	E29		A A	1	01830	
1192	E30		A A	1	01831	
1193	E31		A A	1	01832	
1194	E32		A A	1	01833	
1195	E33		A A	1	01834	
1196	E34		A A	1	01835	
1197	E35		A A	1	01836	
1198	E36		A A	1	01837	
1199	E37		A A	1	01838	
12C0	E38		A A	1	01839	
12C1	E39		A A	1	01840	
12C2	E40		A A	1	01841	
12C3	E41		A A	1	01842	
12C4	E42		A A	1	01843	
12C5	E43		A A	1	01844	
12C6	E44		A A	1	01845	
12C7	E45		A A	1	01846	
12C8	E46		A A	1	01847	
12C9	E47		A A	1	01848	
1210	E48		A A	1	01849	
1211	E49		A A	1	01850	
1212	E50		A A	1	01851	
1213	E51	DC	A A	1	01852	
1214	E52		A A	1	01853	
1215	E53		A A	1	01854	
1216	E54		A A	1	01855	
1217	E55		A A	1	01856	
1218	E56		A A	1	01857	

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1219	ERRTAB	DC	C*&	1	01858	
1220		DC	& 2	1	01859	
1221						

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1223                ***  INITIALIZE RCUTINE FOR THE DICOST PROGRAM ***
1224      INITLE    MCP    1250                PRINT TITLE          10  01860  M %TO 01250 W
1225                BCBI   *-16                                      7  01870  R 01860 2
1226                BAI    *&1                                       7  01877  R 01884 M
1227                CS     99                  RESET IND REG S      6  01884  / 00099
1228                SW     25                  SET WM IN IND REG 1  6  01890  , 00025
1229                MLCS   @*@,100             PREPARE TO LOAD 2-15 12  01896  D 08713 00100 3
1230                MRWR   25,30               LOAD IND REG 2-15    12  01908  D 00025 00030 %
1231                MRCWG  RESUME,1            MOVE RESET PROCEDURE 12  01920  D 02015 00001 L
1232                MRCWG  INTR,101            MOVE INTERUPT PROC   12  01932  D 02007 00101 L
1233      PASSI     B      DATA                GO DO  MORE INITIALIZING 7  01944  J 01710
1234                CW     LPRT,SW11&1                              11  01951  ¤ 02617 01549
1235                CS     E5&                 CLEAR AND RESET      6  01962  / 01857
1236                MLCWS  @L@,STPTAB           ERROR TABLE         12  01968  D 08714 01801 7
1237                B      START               GO TO ROUTINE INIT.  7  01980  J 03419
1238
1239                H                                               1  01987  .
1240                CRG    2CC0                                        02000
1241                B      INITLE                                   7  02000  J 01860
1242                *** RESET & INTERUPT ROUTINES,THESE ROUTINES ***
1243                *** ARE MOVED TO LCCATIONS 1 & 101
1244      INTR      BNQ    PRGCTL              RETURN TO PROG CNTRL 7  02007  J 02273 Q
1245                DCW    @M@                                      1  02014
1246      RESUME    B      CKLUP                                    7  02015  J 02023
1247                DCW    @M@                                      1  02022
1248      CKLUP     BW     MCNITR,LPRT         CHECK FOR LOOP ROUT  12  02023  V 02101 02617 1
1249                BW     LOOP,LPINST         CHECK INST LOOP SW   12  02035  V 01013 02618 1
1250                CW     SW11&1,REPLY&1      CLEAR TYPE SWITCHES  11  02047  ¤ 01549 01652
1251                CW     EXTRA&1                                  6  02058  ¤ 03024
1252                CS     E5&                 CLEAR ERROR TABLE    6  02064  / 01857
1253                MLCWS  @L@,STPTAB                               12  02070  D 08714 01801 7
1254                MLNA   X3,X2               LOAD IX 2            12  02082  D 00039 00034 /
1255                B      MONITR&7            GO TO MCNITR         7  02094  J 02108
1256
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1256                    *** I/O DICOST PROGRAM ***
1259                ***       MONITOR ROUTINE       ***
1260          THE MONITOR IS ENTERED AFTER EVERY TEST ROUTINE IS COMPLETED,OR
1261        A STATUS ERROR HAS BEEN DETECTED AND INDICATED.IN THE CASE OF A
1262        STATUS ERROR MONITOR SIMPLY BRANCHES BACK TO THE POINT AT WHICH
1263        THE STATUS ERROR WAS DETECTED.WHEN ENTERED FROM THE END OF A
1264        TEST ROUTINE MONITOR CHECKS TO SEE IF THE CE PRESSED INQUIRY,THE
1265        ROUTINE IS BEING LOOPED,ANY ERRORS OCCURED,ALTER ROUTINE SEQUENCE
1266        IS SELECTED,OR THE NEXT SEQUENCIAL ROUTINE SHOULD BE RUN.
1267
1268      MONITR    SBR    X2                STORE ADDR                       7  02101  G 00034 B
1269                BXPA   *-1               EXIT ALERT MODE                  7  02108  Y 02115 X
1270                BNQ    PRGCTL            WAS THERE AN INQ                 7  02115  J 02273 Q
1271      MONIT1    BW     0&X3,LPRT         RETURN IF LOOPING RT            12  02122  V 00000 02617 1
1272      MONIT2    MLCWS  &M&,224           SET WMGM SHORT MESG             12  02134  D 08715 00224 7
1273                B      ERRCTL                                             7  02146  J 02677
1274      MONIT3    NOP                                                       1  02153  N
1275                MLCHA  X2,X3             LOAD IX3                        12  02154  D 00034 00039 X
1276                MLCWS  & &,224           CLEAR WMGM                      12  02166  D 08716 00224 7
1277                B      0&X2              GO TO NEXT ROUTINE               7  02178  J 000.0
1278      WHERE2    MLCWS  *-12,224          CLEAR WMGM                      12  02185  D 02184 00224 7
1279                BCE    *&8,0&X2,N        BRCH IF ROUT COMP               12  02197  B 02216 000.0 N
1280                B      0&X2              RETURN TO ROUTINE                7  02209  J 000.0
1281                BZN    *&8,1&X2,2        BRCH IF CHAR IS NUMR            12  02216  V 02235 000.1 2
1282                B      0&X2              RETURN TO ROUTINE                7  02228  J 000.0
1283                BZN    *&8,2&X2,2        BRCH IF CHAR IS NUMR            12  02235  V 02254 000.2 2
1284                B      0&X2              RETURN TO ROUTINE                7  02247  J 000.0
1285                BW     MONIT3,3&X2       BRCH IF CHAR HAS WM             12  02254  V 02153 000.3 1
1286                B      0&X2              RETURN TO ROUTINE                7  02266  J 000.0
1287
```

```
PGLIN     LABEL     OPCDD  OPERAND                                  CT  ADDRS  INSTRUCTION

1289                   *** I/O DICOST PROGRAM ***
1290                ***      PROGRAM CONTROL      ***
1291          WHEN THE CE PRESSES INQUIRY TO SELECT A STANDARD PROGRAM OPTION
1292        THIS ROUTINE IS ENTERED.THE CE ENTERS ON THE TYPEWRITER THE
1293        OPTION CODE DESIRED,ALONG WITH THE DATA NEEDED BY THE OPTION.THE
1294        ROUTINE DETERMINES WHICH OPTION HAS BEEN SELECTED AND INITIATES
1295        THE OPTION.
1296
1297      PRGCTL    RCPW   CTLFLD           READ THE CONSOLE PRT      10  02273  L %TO 00201 R
1298                SBR    X1                                        7  02283  G 00029 B
1299                BEX1   PRGCTL,M        BRCH ON ANY BUT WLR       7  02290  R 02273 M
1300                Sw     CTLFLD&1                                  6  02297  . 00202
1301                BAI    *&1                                       7  02303  R 02310 M
1302                CW     LPRT,LPINST     TURN OFF LOOP SWS        11  02310  ¤ 02617 02618
1303                MLWS   *,E1            CLEAR WM IN ERRCR        12  02321  D 02332 01802 4
1304                MRWR   E1,E2             TABLE                  12  02333  D 01802 01803 8
1305                MLCS   CTLFLD,*&12     MOVE CTL CODE ENTERD     12  02345  D 00201 02368 3
1306                BCE    ENDTST,CTLCOD,  IS CTL CODE BLANK        12  02357  B 08028 02616
1307                BCE    ALTADS          IS CTL CODE 1             6  02369  B 02418
1308                BCE    ALTMEM          IS CTL CODE 2             6  02375  B 02441
1309                BCE    LUPRT           IS CTL CODE 4             6  02381  B 02500
1310                BCE    ONELUP          IS CTL CODE 5             6  02387  B 02529
1311                BCE    RSTART          IS CTL CODE 6             6  02393  B 02563
1312                BCE    CONT            IS CTL CODE 7             6  02399  B 02586
1313                BCE    N15             IS CTL CODE 8             6  02405  B 08059
1314                B      PRGCTL                                    7  02411  J 02273
1315      ALTADS    MLCA   CTLFLD&4,1C03    MOVE IN NEW TADS         12  02418  D 00205 01003 T
1316                CS     MONIT1,299      CLEAR OUT CTL FLD        11  02430  / 02122 00299
1317      ALTMEM    MLCA   CTLFLD&5,*&9     MOVE ADDR TO BE ALTR     12  02441  D 00206 02461 T
1318                RCPW   0               ALTER MEMORY             10  02453  L %TO 00000 R
1319                BEX1   *-16,M          CHECK ALL BUT WLR         7  02463  R 02453 M
1320                BAI    *&1                                       7  02470  R 02477 M
1321                CS     MONIT1,299      CLEAR THE CNTRL FLD      11  02477  / 02122 00299
1322      ALTSEQ    MLCWS  @M@,0&X1        SET WMGM AT END          12  02488  D 08715 0004G 7
1323      LUPRT     Sw     LPRT            TURN ON LOOP SWITCH       6  02500  . 02617
1324                MLNA   CTLFLD&5,X2      LOAD IND REG2            12  02506  D 00206 00034 /
1325                CS     MONIT2,299      CLEAR CNTRL FLD          11  02518  / 02134 00299
```

```
PGLIN   LABEL    OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1324    CNELUP   SW     LPINST          TURN ON LOOP INST SW   6  02529  , 02618
1327    LUPINT   NOPNM                   THIS SW IS TURNED ON  1  02535  N
1328             B      960                 BY ERRCTL          7  02536  J 02590
1329             B      PREP             GO TO PREPARE ROUT    7  02543  J 03413
1330             CW     LUPINTE1         TURN OFF SW           6  02550  S 02636
1331             B      LOOP                                   7  02556  J 01013
1332    RSTART   MLNA   CTLFLD65,X2      LOAD IND REG2         12  02563  D 00208 00036 /
1333             CS     PRNT2,299        CLEAR CNTRL FLD       11  02575  / 02134 00299
1334    CONT     CS     WHERE2,299       CLR CNTL FLD          11  02586  / 02185 00299
1335
1336             I/O DICOST CONSTANTS
1337    CODES    DCW    @J13XRULM@                             8  02604
1338    MODS     DCW    @4321@                                 4  02608
1339             DCW    @8@                                    1  02609
1340             DC     @7@                                    1  02610
1341             DC     @6@                                    1  02611
1342                    @5@                                    1  02612
1343                    @4@                                    1  02613
1344                    @2@                                    1  02614
1345                    @1@                                    1  02615
1346    CTLCOD          @ @                                    1  02616
1347    LPRT     DC     @ @                                    1  02617
1348    LPINST   DC     @ @                                    1  02618
1349    ADDRC2   DCW    ERRTAB           ADDR OF ERR TABLE     5  02623  01858
1350    ERR      DCW    @*ERROR@                               6  02629
1351     ACTION  DC     @REQ ERROR ACTION@,G                  16  02630
1352    ERCODE   DCW    @547P@                                 4  02650
1353     SAVIND  DCW    @1 2 4 8 A B@,G                       11  02651
1354     STIND   DC     @1 2 4 8 A B@,G                       11  02663
1355     NCERSW  DC     @ @                                    2  02675
1356
```

```
PGLIN    LABEL     OPCOD  OPERAND                                    CT  ADORS  INSTRUCTION

1358                  *** I/O DICOST PROGRAM ***
1359                ***       ERROR CONTROL       ***
1360          THIS ROUTINE DETERMINES IF ANY STATUS ERRORS OR PROGRAM DETECT-
1361          ED ERRORS HAVE TO BE INDICATED,IF THERE ARE THIS ROUTINE BUILDS
1362          THE ERROR MESSAGE AND HAS IF TYPED OUT.THIS ROUTINE ALSO CHECKS
1363          TAB 1 TO SEE IF A REQUEST FOR ERROR ACTION SHOULD BE MADE.
1364
1365                LOCATE FAILING INST
1366
1367     ERRCTL   MLCA   X2,X5              LOAD IND REG 5             12  02677  D 00034 00049 T
1368              S      @12,X5                                        11  02689  S 08717 00049
1369              SCNLA  0&X5,0&X5          SCAN THE ROUTINE           12  02700  D 00##0 00##0 S B
1370              SAR    X5                 STORE CHAR ADDR             7  02712  G 00049 A
1371              MLCS   1&X5,*&12          MOVE CHAR TO BE CHKD       12  02719  D 00##1 02742 3
1372              BCE    GOTONE,CODES,      IS OP CODE M               12  02731  B 02775 02604
1373              BCE                       IS OP CODE L                1  02743  B
1374              BCE    SHORT1             IS OP CODE U                6  02744  B 02794
1375              C      X3,X5              HAS ROUTINE BEEN           11  02750  C 00039 00049
1376              BL     LOCFLD              SEARCHED                   7  02761  J 02818 T
1377              B      ERRCTL&12          GO CONTINUE THE SRCH        7  02768  J 02689
1378     GOTONE   MLCWA  10&X5,LOOP&9       LOAD THE LOOP INST         12  02775  D 00#/0 01022 X
1379              B      LOCFLD                                         7  02787  J 02818
1380     SHORT1   MLCWA  5&X5,LOOP&9        LOAD THE LOOP INST         12  02794  D 00##5 01022 X
1381              MLCS   @NO,LOOP           SET NO-OP FOR SHORT        12  02806  0 08712 01013 3
1382                                      INSTRUCTION
1383     LOCFLD   MLCA   LOOP&9,234           MOVE FAILING OPER        12  02818  0 01022 00234 T
1384              MLNA   X3,223               MOVE ADDR OF ROUT        12  02830  0 00039 00223 /
1385              ZA     ADDR02,X1           LOAD IND REG 1             11  02842  M 02623 00029 O O
1386              ZA     @0C209@,X5          LOAD IND REG 5             11  02853  M 08722 00049 M
1387                  SCAN ERROR TABLE & UPDATA ERROR COUNT
1388     ERSCAN   SCNLA  0&X1,0&X1          SCAN THE ERROR TABLE       12  02864  D 000#0 000#0 S B
1389              SAR    X1                 STORE ADDR                  7  02876  G 00029 A
1390              BCE    AFTSRH,1&X1,L C    HAS TABLE BEEN COMP.       12  02883  B 02942 000#1 D L
1391              SW     X1-1              DEFINE ERROR                6  02895  , 00028
1392              MLNWA  X1,0&X5             MOVE ERROR CODE NO.       12  02901  0 00029 00##0 V
1393              A      @3@,X5              UPDATE IND REG 5          11  02913  A 08723 00049
1394                                      NINE TIMES
```

```
PGLIN   LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1395             CW     1&X1,X1-1          CLEAR WW S            11  02924  W 0004I 00028
1396             B      ERSCAN                                    7  02935  J 02864
1397                 LOAD PRINT FIELD WITH ERROR MESG
1398    AFTSRH   BCE    WHERE2,100C,1      BRCH IF BYPASSING ERRORS  12  02942  B 02185 01000 I
1399    ERRCSW   NOP                                              1  02954  N
1400             BCE    WHERE2,209         BRCH IF NO ERRORS         12  02959  B 02185 00209
1401             SW     ERROSW&1           RESET ERROR SW            6  02967  , 02955
1402             MLCA   ERR,206            MOVE ERROR                12  02973  U 02629 00206 I
1403             MLCA   28X3,RCUTID        MOVE ROUTINE IDENT        12  02985  D 000M2 03014 I
1404             B      TYPI               GO TYPE ROUTINE ID        7  02997  J 01593
1405             DCW    8ROUTINE @                                   0  03011
1406    ROUTID   DC     8   8,G                                      3  03014
1407             B      TYPES                                     7  03016  J 01517
1408                 TYPE ADDITIONAL  ERROR INFORMATION
1409    EXTRA    NOPWW                                             1  03023  N
1410             WCP    DATA               PRINT EXTRA DATA          10  03024  M 8TO 01710 W
1411             BCB1   *-16                                       7  03034  R 03024 2
1412             BA1    *&I                                       7  03041  R 03048 M
1413             CW     EXTRA&1                                   6  03048  ¤ 03024
1414    ACT      BCE    *&8,1001,1         LOOP ACTION REQUIRED      12  03054  B 03073 01001 I
1415             B      WHERE2                                    7  03066  J 02185
1416             SW     LUPINT&1           TURN ON SWITCH            6  03073  , 02536
1417             MRCWG  ACTION,201         MOVE ACTION MESG          12  03079  D 02630 00201 L
1418             B      TYPES                                     7  03091  J 01517
1419             B      PRGCTL                                    7  03098  J 02273
1420
1421                 *** I/O DICOST PROGRAM ***
1422             *** DETERMINE WHICH STATUS INDICATORS ARE ON ***
1423        THIS ROUTINE DETERMINES WHICH STATUS INDICATORS ARE ON,ON THE
1424         CHANNEL BEING USED.THE INDICATORS FOUND  ON ARE STORED IN THE
1425          PRINT FIELD AND THE PROGRAM BRANCHES TO ERROR CONTROL.
1426    STACHK   SBR    X5                 STORE ADDR IN IND 5       7  03105  G 00049 B
1427             SBR    X2                                        7  03112  G 00034 B
1428             BW     0&X2,LPRT                                 12  03119  V 000.0 02617 1
1429             S      &7&,X5             REDUCE ADDR BY 7          11  03131  S 08724 00049
1430             MLCS   0&X5,LCOP&10                              12  03142  D 00**0 01023 3
1431             MRCWG  STIND,237          MOVE STATUS CODES         12  03154  D 02663 00237 L
```

```
PGLIN     LABEL     OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1432                MLCS   0&X5,NUOPCC    STORE CHNL CODE  12  03166  D 00**0 03196 3
1433                B      CHALTR                           7  03178  J 01045
1434                DCW    CNTERR         HIGH LIMIT        5  03189  03351
1435                DC     NOTRDY         LOW LIMIT         5  03194  03209
1436                DCW    @ @                              1  03195
1437      NUOPCO    DC     @ @                              1  03196
1438                DC     @ @                              1  03197
1439                ZA     @0C237@,X5     LOAD IX 5        11  03198  Q M 08729 00049
1440      NOTRDY    NOP                                     1  03209  N
1441                BNR1   CNTERR          CHECK FOR NOT READY  7  03210  R 03351 1
1442                B      UPIX           GO UPDATE IND REG  7  03217  J 03382
1443      BUSY      NOP                                     1  03224  N
1444                BCB1   CNTERR          CHECK FOR BUSY    7  03225  R 03351 2
1445                B      UPIX           GO UPDATE IND REG  7  03232  J 03382
1446      DATACK    NOP                                     1  03239  N
1447                BER1   CNTERR          CHECK DATA CHK    7  03240  R 03351 4
1448                B      UPIX           GO UPDATE IND REG  7  03247  J 03382
1449      EXTCND    NOP                                     1  03254  N
1450                BEF1   CNTERR          CHECK FOR EXT COND  7  03255  R 03351 8
1451                B      UPIX           GO UPDATE IND REG  7  03262  J 03382
1452      NOTRNS    NOP                                     1  03269  N
1453                BNT1   CNTERR          CHECK FOR NO TRANS  7  03270  R 03351 $ 8
1454                B      UPIX           GO UPDATE IND REG  7  03277  J 03382
1455      WLR       NOP                                     1  03284  N
1456                BWL1   CNTERR          CHECK FOR WLR     7  03285  R 03351 -
1457                B      UPIX           GO UPDATE IND REG  7  03292  J 03382
1458                SW     NOTRDY&1,BUSY&1  RESET INSTRUCTIONS  11  03299  , 03210 03225
1459                SW     DATACK&1,EXTCND&1                11  03310  , 03240 03255
1460                SW     NOTRNS&1,WLR&1                   11  03321  , 03270 03285
1461                MRCG   237,SAVIND     SAVE IND          12  03332  D 00237 02651 $
1462                B      ERRCTL         RETURN            7  03344  J 02677
1463      CNTERR    SBR    X6             STORE RETURN ADDR  7  03351  G 00054 B
1464                A      @7@,X6         UPDATE RETURN ADDR  11  03358  A 08724 00054
1465                CW     ERROSW&1       TURN OFF ERROR SW  6  03369  ¤ 02955
1466                B      UPIX&19                          7  03375  J 03401
1467      UPIX      SBR    X6             STORE RETURN ADDR  7  03382  G 00054 B
1468                MLCS   @ @,0&X5       REMOVE STATUS CHAR  12  03389  D 08716 00**0 3
```

```
PGLIN   LABEL   OPCOD  OPERAND                    CT  ADDRS   INSTRUCTION
1469            A      328,X5      UPDATE IND REG 5   11  03401  A 05F10 000049
1470            B      0016          RETURN TO PROGRAM     7  03412  J 0009,0
```

```
PGLIN     LABEL     OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION

1472      CTLFLD    EQU    201
1473                PST
```

```
RGLIN    LABEL    OPCOD  OPERAND                    CT  ADDRS  INSTRUCTION
1475                     *** TEST ROUTINE DESCRIPTION ***
1476                 *** INITIALIZE COUNTERS & DELAY CONSTANTS ***
1477     START       CW     COLDSW&1,NUCHL&1           11  02419  M 04155 03763
1478                 SW     ADDR00&1                    6  03430  S 08483
1479                 S      LNGCNT          INITIALIZE  6  03436  S 08684
1480                 S      HARMCT             ALL      6  03442  S 08683
1481                 S      TIMCNT           COUNTERS   6  03448  S 08673
1482                 S      LOOPTI             USED     6  03454  S 08667
1483                 S      CORR                IN      6  03460  S 08680
1484                 S      COUNT             THIS      6  03466  S 08664
1485                 S      RUTCNT              PROG     6  03472  S 08653
1486                 S      ADDR00&1                    6  03478  S 08483
1487                 S      ADDR00                      6  03484  S 08482
1488                 ZA     &01332&,X10  LOAD IX 10      11  03490  M 08735 00074 Q
1489                 ZA     &0C0003&,X15 LOAD IX 15      11  03501  M 08740 00099 Q
1490                 BCE    C1410,1256,0 BRCH IF USING A 1410  12  03512  B 03598 01256 0
1491                 BCE    C1410I,1256,I BRCH IF A 1410I  12  03524  B 03567 01256 I
1492     C7010       MLCA   LOOPX,LOOPTI SET TIMING CONSTANTS  12  03536  D 08699 08667 T
1493                 MLCA   CORRX,CORR     FOR A 7010    12  03548  D 08701 08680 T
1494                 B      GETSET                       7  03560  J 03634
1495     C1410I      MLCA   CORRI,CORR   SET TIMING CONSTANTS  12  03567  D 08706 08680 T
1496                 MLCA   LOOPI,LOOPTI   FOR A 1410I   12  03579  D 08704 08667 T
1497                 B      GETSET                       7  03591  J 03634
1498     C1410       MLCA   CORRO,CORR   SET TIMING CONSTANTS  12  03598  D 08711 08680 T
1499                 MLCA   LOOPO,LOOPTI     FOR A 1410  12  03610  D 08709 08667 T
1500                 BCE    TIMEIT-17,SPTADO,1 BRCH IF IN MANUAL MODE  12  03622  B 03665 01004 1
1501     GETSET      B      TYPI                         7  03634  J 01593
1502                 DCW    &AUTO MODE,HAD SWITCH ON&,G 23  03663
1503                 WCP    BLANK               MOVE TYPE CARRIAGE  10  03665  M &TO 08657 W G
1504                 BA1    *&1                          7  03675  R 03682 M
1505     TIMEIT      WCP    BLANK               TRY TO TYPE AGAIN  10  03682  M &TO 08657 W G
1506                 BA1    *&1                          7  03692  R 03699 M
1507                 BCB1   *&8                 BRCH BUSY  7  03699  R 03713 2
1508                 B      GOTEST                       7  03706  J 03731
1509                 A      &03150&,TOTIME      ADD CONSTANT TO TIME  11  03713  A 08744 08662
1510                 B      TIMEIT                       7  03724  J 03682
1511     GOTEST      ZA     N13,X3              LOAD IX 3  11  03731  M 07734 00039 Q
```

INITIALIZE FOR DCC4

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1512		B	N13&10	7	03742	J 07744

```
POLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1514                   *** TEST ROUTINE DESCRIPTION ***
1515                   *** WARM UP HYDRAULIC OIL ***
1516          THIS ROUTINE OPERATES ALL READY ACCESS FOR 5 MINUTES IN ORDER TO
1517          INSURE THAT THE OIL IS AT 105 DEGREES TEMPETURE SO THAT THE SEEK
1518          TIMINGS MAY BE MADE USING THE FAST OSCILATOR.A MESSAGE INDICATES
1519          THE BEGINING AND END OF THE WARMUP PERIOD.IF POWER HAS JUST BEEN
1520          BROUGHT UP ON THE 1302 AN ADDITIONAL 20 MINUTE WARMUP PERIOD
1521          SHOULD BE TAKEN.THIS ADDITIONAL WARM-UP MAY BE SELECTED BY ALTER-
1522          ING SPECIAL YAC 0,LOC 1004 TO A 1.USE OPTION CODE 2 TO ALTER
1523          THE YAC WHILE IN THE FIRST 5 MINUTE WARM-UP PERIOD.
1524          WHEN THE WARM UP IS COMPLETE ALL ACCESS ARE REZEROED TO KEEP THE
1525          OIL CIRCULATING AND WARM.
1526
1527      N14       NOP                                               1  03749  N
1528                DC      @14@              ROUTINE ID .            2  03751
1529      NUCHL     NOPWM                                             1  03752  N
1530                B       N14XIT                                    7  03753  J 04358
1531                SW      NUCHL&1                                   6  03760  , 03753
1532                B       TYP1                                      7  03766  J 01593
1533                CCW     @BEGINING 5 MINUTE WARMUP@,G             24  03796
1534                S       WARMCT                                    6  03798  S 08683
1535                S       LNGCNT                                    6  03804  S 08684
1536      BOTTOM    S       ADR249&1          RESET                   6  03810  S 08527
1537                S       ADR125&1                ACCESS AND        6  03816  S 08549
1538                S       ADR000&1                        MODULE ADDRESSES  6  03822  S 08560
1539      STAR16    SD      1,ADR000          SEEK ACC TO CYL 000     10  03828  M %F0 08559 R
1540                BCB1    *-16                                      7  03838  R 03828 2
1541                BA1     *&1                                       7  03845  R 03852 M
1542                A       @1@,ADR000        UPDATE ACCESS ADDR      11  03852  A 08717 08559
1543                BCE     *&8,ADR000,2      BRCH IF ACCESS ADDR IS 2  12  03863  B 03882 08559 2
1544                B       STAR16                                    7  03875  J 03828
1545                S       ADR000                                    6  03882  S 08559
1546                A       @1@,ADR000&1      UPDATE MODULE ADDR      11  03888  A 08717 08560
1547                BCE     *&8,ADR000&1,0    BRCH IF MODULE ADDR IS 0  12  03899  B 03918 08560 0
1548                B       STAR16                                    7  03911  J 03828
1549      STAR17    SD      1,ADR125          SEEK ACCESS TO CYL 125  10  03918  M %F0 08548 R
1550                BCB1    *-16                                      7  03928  R 03918 2
```

```
PGLIN  LABEL   OPCOD  OPERAND                          CT  ADDRS  INSTRUCTION
1551           BA1    *&1                               7  03935  R 03942 G M
1552           A      &1&,ADR125       UPDATE ACCESS ADDR  11  03942  A 08717 08548
1553           BCE    *&8,ADR125,2     BRCH IF ACCESS ADDR IS 2  12  03953  B 03972 08548 2
1554           B      STAR17                            7  03965  J 03918
1555           S      ADR125           RESET ACCESS ADDR  6  03972  S 08548
1556           A      &1&,ADR125&1     UPDATE MODULE ADDR  11  03978  A 08717 08549
1557           BCE    *&8,ADR125&1,0   BRCH IF MODULE ADDR IS 0  12  03989  B 04008 08549 0
1558           B      STAR17                            7  04001  J 03918
1559  STAR18   SC     1,ADR249         SEEK ACCESS TO CYL 249  10  04008  M %F0 08526 R
1560           BCB1   *-16                              7  04018  R 04008 2 G
1561           BA1    *&1                               7  04025  R 04032 M
1562           A      &1&,ADR249       UPDATE ACCESS ADDR  11  04032  A 08717 08526
1563           BCE    *&8,ADR249,2     BRCH IF ACCESS ADDR IS 2  12  04043  B 04062 08526 2
1564           B      STAR18                            7  04055  J 04008
1565           S      ADR249           RESET ACCESSADDR  6  04062  S 08526
1566           A      &1&,ADR249&1     UPDATE MODULE ADDR  11  04068  A 08717 08527
1567           BCE    *&8,ADR249&1,0   BRCH IF MODULE ADDR IS 0  12  04079  B 04098 08527 0
1568           B      STAR18                            7  04091  J 04008
1569           A      &1&,WARMCT       ADD 1 TO PASS COUNT  11  04098  A 08717 08683
1570           BCE    *&15,WARMCT-2,5  BRCH ON 500TH PASS  12  04109  B 04135 08681 5
1571           B      MONITR                            7  04121  J 02101
1572           B      BOTTOM                            7  04128  J 03810
1573           BCE    *&8,SPTACO,1     BRCH IF IN MANUAL MD  12  04135  B 04154 01004 1
1574           B      WARM                              7  04147  J 04231
1575  COLDSW   NOPWM                                    1  04154  N
1576           B      NOMSG            BY PASS MESSAGE  7  04155  J 04189
1577           B      TYP1                              7  04162  J 01593
1578           DCW    &BEGIN 20 MIN WARMUP&,G           19  04187
1579  NOMSG    SW     COLDSW&1                          6  04189  , 04155
1580           S      WARMCT                            6  04195  S 08683
1581           A      &1&,LNGCNT       ADD 1 TO LONG COUNT  11  04201  A 08717 08684
1582           BCE    WARM,LNGCNT,5                     12  04212  B 04231 08684 5
1583           B      STAR16                            7  04224  J 03828
1584  WARM     SC     1,REZADR         SET ACC TO REZERO POSITION  10  04231  M %F0 08570 R
1585           BCB1   *-16                              7  04241  R 04231 2 G
1586           BA1    *&1                               7  04248  R 04255 M
1587           A      &1&,REZADR       UPDATE ACCESS ADDR  11  04255  A 08717 08570
1588           BCE    *&8,REZADR,2     BRCH IF ACCESS ADDR IS 2  12  04266  B 04285 08570 2
```

WARM UP HYDRAULIC OIL

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1589		B	WARM		7	04278	J 04231
1590		S	REZACR	RESET ACCESS ADDR	6	04285	S 08570
1591		A	@12,REZADR61	UPDATE MODU	11	04291	A 08717 08571
1592		BCE	*60,REZADR61,0	BRCH IF MODULE ADR	12	04302	B 04321 08571 0
1593		B	WARM		7	04314	J 04231
1594		B	TYP1		7	04321	J 01593
1595		DCW	@WARMUP COMPLETE,TEST BEGINING@,G		29	04356	
1596	R14XIT	B	MONITR		7	04358	J 02101
1597							

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1599                       *** TEST ROUTINE DESCRIPTION ***
1600                     *** TEST WORST CASE SEEK ***
1601          THIS ROUTINE CAUSES THE ACCESS TO TRAVEL THE MAXIMUM DISTANCE,
1602        ACTUATING EVERY PISTON & GLOB EXCEPT THE 10 PISTON AND CAUSING
1603        THE LARGEST AMOUNT OF OIL CIRCULATION.THE ARRIVAL OF THE ACCESS
1604        AT CYL 249 IS VERIFIED AND ERROR 14 IS INDICATED IF IT IS INCOR
1605        RECT.THE ROUTINE IS REPEATED 10 TIMES.
1606
1607      NO4       NOP                                          1  04365  N
1608                CC      @04@             ROUTINE ID          2  04367
1609      START4    SD      1,ADDR00         RESET ACCESS       10  04368  M %F0 08482 R
1610                BCB1    *-16                                 7  04378  R 04368 2
1611                BA1     STACHK           BRCH ON ANY ERROR   7  04385  R 03105 M G
1612                MLCB    ADDR00&1,ADR249&1                   12  04392  D 08483 08527 L
1613                SC      1,ADR249         SEEK CYL 249 FRCM 0 10  04404  M %F0 08526 R
1614                BCB1    *-16                                 7  04414  R 04404 2
1615                BA1     STACHK           BRCH ON ANY ERROR   7  04421  R 03105 M G
1616                MU      %F5,ADR249,R     CHECK ARRIVAL      10  04428  M %F5 08526 R
1617                BCB1    *-16                                 7  04438  R 04428 2
1618                BA1     *&1                                  7  04445  R 04452 M G
1619      TWO49     BEF1    *&8                                  7  04452  R 04466 8
1620                B       NO4CNT                               7  04459  J 04486
1621                BNT1    ERCR14                               7  04466  R 04480 B S
1622                B       NO4CNT                               7  04473  J 04486
1623                *** SET ERRCR 14 CN ***
1624      ERCR14    SW      E14              TURN ON ERROR COUNT 6  04480  , 01815
1625        ACCESS DID NOT ARRIVE AT CYL 249,READ RESULTS IN NC RECORD FOUND
1626      NO4CNT    A       @1@,RUTCNT       UPDATE PASS COUNT  11  04486  A 08717 08653
1627                BCE     NO4XIT,RUTCNT,0  BRCH IF COUNT IS 10 12  04497  B 04516 08653 0
1628                B       START4                               7  04509  J 04368
1629      NO4XIT    B       MONITR                               7  04516  J 02101
1630
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1632                ***  RANDOM SEEK TEST  ***
1633                  THE SPEED OF THE CARRIAGE RETURN IS USED TO DEVELOPE A RANDOM
1634                NUMBER WHICH IS USED TO DEVELOPE A RANDOM ADDRESS FOR THE FILE.
1635                ONE HUNDRED SEEKS USING RANDOM ADDRESSES ARE ISSUED,EACH SEEK IS
1636                CHECKED FOR CORRECT ACCESS POSITION WITH A READ OP.IF THE ACCESS
1637                HAS REZERDED ERROR 15 IS INDICATED,IF THE ACCESS HAS POSITIONED
1638                INCORRECTLY ERROR 16 IS INDICATED.IN THE CASE OF ERROR 16 IF THE
1639                PROGRAM IS IN MANUAL MODE,-SPECIAL TAD 0 IS 1-THE HA1 ON THE FILE
1640                WILL BE READ OFF AND DISPLAYED ON THE CONSOLE FOR ANALYSIS.
1641
1642      NO5       NOP                                              1  04523  N
1643                DC      @05@          RDUTINE ID                 2  04525
1644      START5    MLNWA   TOTIME,VARIAC&5  MOVE IN RANDOM ADDR     12  04526  D 08662 08641 V
1645                MLC8    ADDR00&1,VARIAD&1                        12  04538  D 08483 08637 L
1646                SC      1,VARIAD      SEEK ACCESS                10  04550  M %F0 08636 R
1647                BC81    *-16                                     7  04560  R 04550 2
1648                BA1     STACHK        BRCH ON ANY ERROR          7  04567  R 03105 G M
1649                MU      %F5,VARIAC,R  CHECK ARRIVAL              10  04574  M %F5 08636 R
1650                BC81    *-16                                     7  04584  R 04574 2
1651                BA1     *&1                                      7  04591  R 04598 G M
1652                BEF1    *&8                                      7  04598  R 04612 8
1653                B       RANDOM                                   7  04605  J 04619
1654                BNT1    ERCR16                                   7  04612  R 04672 S B
1655      RANDOM    A       @77777@,TOTIME  ALTER VARIABLE           11  04619  A 08748 08662
1656                SW      VARIAC&2        BY 300 AND ADD           6  04630  , 08638
1657                A       TOTIME,VARIAC&5   RESULT TO TKHD ADR     11  04636  A 08662 08641
1658                A       @1@,COUNT     ADD 1 TO PASS COUNT        11  04647  A 08717 08664
1659                BZ      NO5XIT        BRCH AFTER 100 PASS        7  04658  J 04816 V
1660                B       START5&24                                7  04665  J 04550
1661              *** SET ERROR 16 ON ***
1662      ERCR16    SW      E16,EXTRA&1   TURN ON ERROR IND           11  04672  , 01817 03024
1663        ACCESS OID NOT POSITION CORRECTLY,READ RESULTS IN NO RECORD FOUND
1664                MRCWG   VARIAD,DATA   MOVE FAILING ADDR          12  04683  O 08636 01710 D L
1665                BA1     STACHK        GO TO STATUS CHECK         7  04695  R 03105 G M
1666                BCE     *&8,SPTADD,1  BRCH IF IN MANUAL MO       12  04702  B 04721 01004 1
1667                B       RANDOM                                   7  04714  J 04619
1668                B       TYP1          GO REQUEST THAT            7  04721  J 01593
```

RANDOM SEEK TEST

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1669		DCW	@CE-HAD ON@,G	CE-HAD BE TURNED ON	9	04736	
1670		H		WAIT FOR ACTION	1	04738	.
1671		MU	%F5,VARIAD,R	READ FAILING ADDR	10	04739	M %F5 08636 R
1672		BCB1	*-16		7	04749	R 04739 2 G
1673		BA1	*&1		7	04756	R 04763 M
1674		MLCA	VARFLD&6,ADRMSG&15	MOVE FAILING ADDR	12	04763	D 08651 04797 T
1675		B	TYP1	GO TYPE FAILING ADDR	7	04775	J 01593
1676	ADRMSG	DCW	@ADDR READ	,CE-HAD OFF@,G	27	04782	
1677		H	RANDOM	WAIT FOR ACTION	6	04810	. 04619
1678	NOSXIT	B	MONITR		7	04816	J 02101

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1680          THIS ROUTINE CHECKS THE MAKE AND BREAK OF THE INNER CE SWITCH
1681          BY SEEKING FROM CYL 10 TO 249,A READ OP CHECKS ARRIVAL AT THE
1682          PROPER TRACK AND IF THE CE SWITCH WAS MADE ERROR 2 IS INDICATED
1683          THE ACCESS IS NOW MOVED FROM CYL 249 TO 250 AND THE ARRIVAL IS
1684          VERIFIED BY A READ.IF THE CE SWITCH DID NOT MAKE ERROR 3 IS
1685          INDICATED.THE ROUTINE IS REPEATED 10 TIMES.
1686
1687      NO1         NOP                                                    1  04823  N
1688                  DC      2012            ROUTINE IO                     2  04825
1689                  MLC8    ADDR00&1,ADRXXX&1                             12  04826  D 08483 08604 L
1690                  MLC8    ADDR00&1,ADR249&1                             12  04838  D 08483 08527 L
1691                  MLC8    ADDR00&1,ADR250&1                             12  04850  D 08483 08615 L
1692      CVRSHT      SC      1,ADRXXX        POSITION ACCESS AT CRITICAL PT 10  04862  M 3F0 08603 R
1693                  BCB1    *-16                                           7  04872  R 04862 2
1694                  BA1     STACHK          REPORT ANY ERROR               7  04879  R 03105 M
1695                  SC      1,ADR249        SEEK ACC TO CYL 249           10  04886  M 3F0 08526 R
1696                  BCB1    *-16                                           7  04896  R 04886 2
1697                  BA1     STACHK          REPORT ANY ERROR               7  04903  R 03105 M
1698                  MU      3F5,ADR249,R    VERIFY ARRIVAL & CHECK FOR CE 10  04910  M 3F5 08526 R
1699                  BCB1    *-16                                           7  04920  R 04910 2
1700                  BA1     *&1                                            7  04927  R 04934 M
1701                  BEF1    *&8             BRCH ON NO RECORD FOUND        7  04934  R 04948 8
1702                  B       CESWCN                                         7  04941  J 04962
1703                  BNT1    STACHK          GO REPORT ERROR                7  04948  R 03105 S
1704                  B       GOTOCE          NO  ERROR GO TO NEXT TEST      7  04955  J 04996
1705      CESWON      BER1    *&8             CHECK FOR CE SWITCH BEING MADE 7  04962  R 04976 4
1706                  B       GOTOCE                                         7  04969  J 04996
1707                  BNT1    *&8             BRCH IF CE SWITCH WAS ON       7  04976  R 04990 S
1708                  B       GOTOCE                                         7  04983  J 04996
1709                ***  SET ERROR 2 ON  ***
1710                  SW      E2              SET ERROR IND                  6  04990  , 01803
1711        CE SWITCH MADE WHEN ACCESS WAS MOVED FROM CYL 10 TO CYL 249
1712      GOTOCE      SC      1,ADR250        SEEK ADDR CYL 250             10  04996  M 3F0 08614 R
1713                  BCB1    *-16                                           7  05006  R 04996 2
1714                  BA1     STACHK          REPORT ABY ERROR               7  05013  R 03105 M
1715                  MU      3F5,ADR250,R    VERIFY ARRIVAL AT CE CYL      10  05020  M 3F5 08614 R
1716                  BCB1    *-16                                           7  05030  R 05020 2
```

```
                      TEST INNER CE TRACK
PGLIN   LABEL         OPCOD  OPERAND                                                       CT  ADDRS  INSTRUCTION
1717                  BA1    *&1                                                            7  05037  R 05044 GM
1718                  BEF1   *&8               CHECK FOR NO RECORD FOUND                    7  05044  R 05058 8
1719                  B      SWCN                                                           7  05051  J 05072
1720                  BNT1   STACHK            GO REPORT ERROR                              7  05058  R 03105 SB
1721                  B      COUNT1            BRCH NO ERRORS                               7  05065  J 05127
1722    SWCN          BER1   *&8               CHECK FOR CE SWITCH MADE                     7  05072  R 05086 4
1723                  B      COUNT1                                                         7  05079  J 05127
1724                  BNT1   *&8               BRCH IF CE SWITCH MADE                       7  05086  R 05100 SB
1725                  B      COUNT1                                                         7  05093  J 05127
1726    SWCN1         BER1   *&8                                                            7  05100  R 05114 4
1727                  B      *&15                                                           7  05107  J 05128
1728                  BNT1   *&7               BRCH ON NO TRANSFER                          7  05114  R 05127 SB
1729                *** SET ERROR 3 ON ***
1730                  SW     E3                TURN ON ERROR IND                            6  05121  , 01804
1731       CE SWITCH DID NOT MAKE WHEN ACCESS WAS MOVED TO CYL 250 FROM 249
1732    COUNT1        A      &1&,RUTCNT                                                    11  05127  A 08717 08653
1733                  BZ     *&8               BRCH AFTER 10 PASSES                         7  05138  J 05152 V
1734                  B      CVRSHT                                                         7  05145  J 04862
1735    A01XIT        B      MONITR                                                         7  05152  J 02101
```

```
PGLIN   LABEL    OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION
1737            THIS ROUTINE TEST THE MAKE AND BREAK OF THE OUTER CE SWITCH AND
1738            THE TIME IT TAKES THE ACCESS TO GO FROM REZERO TO CYL 0.IF THE
1739            OUTER CE SWITCH DOES NOT MAKE WHEN THE ACCESS IS FORCED TO REZERO
1740            FROM CYL 0,ERROR 4 IS INDICATED.IF THE OUTER CE SWITCH DOES NOT
1741            BREAK WHEN IT MOVES FROM REZERO TO CYL 0 ERROR 5 IS INDICATED.THE
1742            TIME REQUIRED FOR THE ACCESS TO MOVE FROM REZERO TO CYL 0 IS
1743            RECORDED AND AFTER 10 PASSES AN AVERAGE TIME IS TYPED OUT FOR THE
1744            ACCESS MOTION AND IF THE TIME IS EXCESSIVE IT CAN INDICATE  THAT
1745            THE DETENT IS BINDING.
1746
1747    A02     NOP                                                       1  05159  N
1748            DC      @022@             ROUTINE ID                      2  05161
1749            MLCB    ADDR00&1,ADRYYY&1                                 12  05162  D 08483 08626 L
1750            S       TIMCNT            RESET                           6  05174  S 08673
1751            S       AVGTME            TIME AND PASS                   6  05180  S 08678
1752            S       RUTCNT            COUNTERS                        6  05186  S 08653
1753    OUTBR   SD      1,ADDR00          POSITION ACC AT CYL 0           10  05192  M %F0 08482 R
1754            BC81    *-16                                              7  05202  R 05192 2
1755            BAL     STACHK            REPORT ANY EROR                 7  05209  R 03105 M
1756            MU      %F5,ADDR00,R      VERIFY ARRIVAL                  10  05216  M %F5 08482 R
1757            BC81    *-16                                              7  05226  R 05216 2
1758            BAL     *&1                                               7  05233  R 05240 M
1759            BEF1    *&8               CHECK FOR NO RECORD FOUND       7  05240  R 05254 8
1760            B       REZRO                                             7  05247  J 05275
1761            BNT1    *&8               BRCH IF NO RECORD FOUND         7  05254  R 05268 8
1762            B       REZRO                                             7  05261  J 05275
1763            BAL     STACHK            GO REPORT ERROR                 7  05268  R 03105 M
1764    REZRO   SD      1,ADRYYY          SEEK ACCESS TO REZERO           10  05275  M %F0 08625 R
1765            BC81    *-16                                              7  05285  R 05275 2
1766            BAL     STACHK            REPORT ANY ERROR                7  05292  R 03105 M
1767            MU      %F5,ADDR00,R      VERIFY ACC REZEROED             10  05299  M %F5 08482 R
1768            BC81    *-16                                              7  05309  R 05299 2
1769            BAL     *&1                                               7  05316  R 05323 M
1770            BER1    *&8               CHECK FOR NO RECORD FOUND       7  05323  R 05337 4
1771            B       *&8                                               7  05330  J 05344
1772            BNT1    BACTOO            BRCH IF NO RECORD FOUND         7  05337  R 05362 8
1773                  *** SET ERROR 4 ON ***
```

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1774                SW     E4                TURN ON ERROR IND      6  05344  , 01805
1775          OUTER CE SWITCH DIC NOT MAKE WHEN ACCESS REZEROED
1776                BW     MONITR,E4         BRCH IF CE SW WAS NOT  SET  12  05350  V 02101 01805 1
1777      BACTCO    SC     1,ADDR00          SEEK DISK TO 0         10  05362  M %F0 08482 R
1778                BCB1   *-16                                     7  05372  R 05362 2
1779                BA1    *&1                                      7  05379  R 05386 M
1780      REZ020    MU     %F5,ADDR00,R      TEST BUSY LINE         10  05386  M %F5 08482 R
1781                BCB1   *&15                                     7  05396  R 05417 2
1782                BA1    *&1                                      7  05403  R 05410 M
1783                B      REZTIM                                   7  05410  J 05435
1784                A      LOCPTI,TIMCNT     ADD LOOP TIME TO ACCUMULATOR  11  05417  A 08667 08673
1785                B      REZ020                                   7  05428  J 05386
1786      REZTIM    A      CORR,TIMCNT       ADD CORRECTION FACTOR  11  05435  A 08680 08673
1787                A      TIMCNT-3,AVGTME   ADD TIME TO AVERAGE TIME ACC  11  05446  A 08670 08678
1788                BER1   *&8               CHECK FOR NO RECORD FOUND  7  05457  R 05471 4
1789                B      *&21                                     7  05464  J 05491
1790                BNT1   *&8               BRCH IF NO RECORD FOUND  7  05471  R 05485 S B
1791                B      *&7                                      7  05478  J 05491
1792               *** SET ERROR 5 ON ***
1793                SW     E5                TURN ON ERROR IND      6  05485  , 01806
1794          OUTER CE SWITCH DIC NOT BREAK WHEN ACCESS MOVED TO CYL 0
1795                A      &12,RUTCNT        COUNT 10 PASSES        11  05491  A 08717 08653
1796                BZ     *&8               BRCH AFTER 10 PASSES   7  05502  J 05516 V
1797                B      CUTER                                    7  05509  J 05192
1798                SW     AVGTME-3                                 6  05516  , 08675
1799                MLNA   AVGTME-1,REZMSG&36 MOVE AVERAGE TIME     12  05522  D 08677 05577 /
1800                B      TYP1                                     7  05534  J 01593
1801      REZMSG    DCW    &SEEK TIME FROM REZERO TO CYL 0 IS     MSEC.&.G  43  05541
1802                CW     AVGTME-3                                 6  05585  ¤ 08675
1803      NO2XIT    B      MONITR                                   7  05591  J 02101
```

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1805			*** TEST ROUTINE DESCRIPTION ***				
1806			*** TIME 50 MILLIE SEC SEEKS,CYL 0 TO CYL 9 ***				
1807			THE ACCESS IS POSITIONED AT CYL 0 AND THEN SEEKED TO CYL 9,THE				
1808			ACCESS IS ISSUED ANOTHER SEEK AND THE BUSY LINE IS CHECKED.AS				
1809			LONG AS THE BUSY LINE REMAINS UP THE PROGRAM STAYS IN A TIMING				
1810			LOOP,WHEN BUSY DROPS THE PROGRAM STORES THE TIME THE BUSY LINE				
1811			WAS UP AND REPEATS THE ROUTINE.AFTER 10 PASSES THE AVERAGE TIME				
1812			IS STORED AND THE PROGRAM GOES TO THE NEXT ROUTINE.STATUS INDICAT				
1813			ORS TURNED ON WILL BE INDICATED				
1814							
1815	N06	NOP			1	05598	N
1816		DC	@06@	ROUTINE IO	2	05600	
1817		S	TIMCNT		6	05601	S 08673
1818		S	AVGTME	RESET COUNTERS	6	05607	S 08678
1819		S	RUTCNT		6	05613	S 08653
1820		MLCB	ACCR00&1,ACCR9&1		12	05619	D 08483 08494 L
1821	ZERO29	SD	1,ADDR00	RESET ACCESS	10	05631	M %F0 08482 R
1822		BCB1	*-I6		7	05641	R 05631 2
1823		BAL	STACHK	BRCH ON ANY ERROR	7	05648	R 03105 G M
1824		SD	1,ACCR9	SEEK ACCESS TO CYL 9	10	05655	M %F0 08493 R
1825		BCB1	*-I6		7	05665	R 05655 2
1826		BAL	STACHK	BRCH ON ANY ERROR	7	05672	R 03105 G M
1827	SHORT	SD	1,ACCR9	TRY ANOTHER SEEK	10	05679	M %F0 08493 R
1828		BCB1	*&15	BRCH BUSY	7	05689	R 05710 2
1829		BAL	STACHK	BRCH ON ANY ERROR	7	05696	R 03105 G M
1830		B	FIFTY		7	05703	J 05728
1831		A	LOOPTI,TIMCNT	ADD LOOP TIME TO	11	05710	A 08667 08673
1832		B	SHORT	TOTAL SEEK TIME	7	05721	J 05679
1833	FIFTY	A	CORR,TIMCNT		11	05728	A 08680 08673
1834		A	TIMCNT-3,AVGTME	ADD	11	05739	A 08670 08678
1835		S	TIMCNT	RESET TIME ACCUMULATOR	6	05750	S 08673
1836		A	@I@,RUTCNT	ADD 1 TO PASS COUNT	11	05756	A 08717 08653
1837		BZ	*&8	BRCH AFTER 10 PASSES	7	05767	J 05781 V
1838		B	ZERO29		7	05774	J 05631
1839		SW	AVGTME-3		6	05781	, 08675
1840		MLNA	AVGTME-1,OUT10&20	MOVE AVERAGE TIME	12	05787	D 08677 07442 /
1841		CW	AVGTME-3		6	05799	¤ 08675

TIME 50 MILLI SEC SEEKS CYL 0 TO CYL 9 DC04 PAGE 255

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
1842	NO6XIT	B	MONITR	7	05805	J 02101

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1844		THIS ROUTINE TIMES ACCESS MOTION BETWEEN CYL 0 AND CYL 10,WHICH					
1845		CAUSE THE 10 PISTON TO BE ACTUATED.THE SEEK TIMES ARE STORED FOR					
1846		10 PASSES AND AN AVERAGE SEEK TIME IS RECORDED.ANY STATUS ERRORS					
1847		WILL BE INDICATED.					
1848							
1849	NO3	NOP			1	05812	N
1850		DC	@03@	ROUTINE ID	2	05814	
1851		MLCB	ADDR00&1,ADDR10&1		12	05815	D 08483 08505 L
1852		S	TIMCNT	RESET	6	05827	S 08673
1853		S	AVGTME	TIME & PASS	6	05833	S 08678
1854		S	RUTCNT	COUNTERS	6	05839	S 08653
1855	TO10	SC	1,ADDR00	POSITION ACC AT CYL 0	10	05845	M %F0 08482 R
1856		BCB1	*-16		7	05855	R 05845 2
1857		BA1	STACHK	REPORT ANY ERROR	7	05862	R 03105 G M
1858		SC	1,ADDR10	SEEK ACC TO CYL 10	10	05869	M %F0 08504 R
1859		BCB1	*-16		7	05879	R 05869 2
1860		BA1	STACHK	REPORT ANY ERROR	7	05886	R 03105 G M
1861	ZERO10	SC	1,ADDR10	FORCE BUSY ON	10	05893	M %F0 08504 R
1862		BCB1	*&15	BRCH ON BUSY	7	05903	R 05924 2
1863		BA1	STACHK	REPORT ANY ERROR	7	05910	R 03105 G M
1864		B	INTEN		7	05917	J 05942
1865		A	LOCPTI,TIMCNT	ADD LOOP TIME TO ACCUMULATOR	11	05924	A 08667 08673
1866		B	ZERO10		7	05935	J 05893
1867	INTEN	A	CORR,TIMCNT	ADD CORRECTION FACTOR	11	05942	A 08680 08673
1868		A	TIMCNT-3,AVGTME	ADD	11	05953	A 08670 08678
1869		S	TIMCNT		6	05964	S 08673
1870		A	@1@,RUTCNT	ADD ONE TO PASS COUNT	11	05970	A 08717 08653
1871		BZ	*&8	BRCH AFTER 10 PASSES	7	05981	J 05995 V
1872		B	TO10		7	05988	J 05845
1873		SW	AVGTME-3		6	05995	, 08675
1874		MLNA	AVGTME-1,OUT11&20	MOVE AVERAGE TIME	12	06001	D 08677 07481 /
1875		CW	AVGTME-3		6	06013	¤ 08675
1876	NO3XIT	B	MONITR		7	06019	J 02101

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1878			*** TEST ROUTINE DESCRIPTION ***				
1879			*** TIME 110 MILLI SEC SEEKS,CYL 0 TO CYL 49 ***				
1880			WITH THE ACCESS POSITIONED AT CYL 0,A SEEK TO CYL 49 IS ISSUED				
1881			FOLLOWED BY A 2ND SEEK TO CYL 49.THE PROGRAM TIMES THE DURATION				
1882			OF THE BUSY FROM THE 1ST SEEK TO CYL 49,WHEN BUSY DROPS THE PROG-				
1883			RAM STORES THE TIME AND REPEATS THE ROUTINE.AFTER 10 PASSES THE				
1884			AVERAGE SEEK TIME IS STORED AND THE NEXT ROUTINE IS RUN.ANY				
1885			STATUS ERRORS WILL BE INDICATED.				
1886							
1887	NO7	NOP			1	06026	N
1888		DC	@07@	ROUTINE ID	2	06028	
1889		MLC8	AOCR00&1,AOOR49&1		12	06029	D 08483 08538 L
1890		S	TIMCNT	RESET TIME COUNT	6	06041	S 08673
1891		S	AVGTME	RESET COUNTERS	6	06047	S 08678
1892		S	RUTCNT	RESET COUNTERS	6	06053	S 08653
1893	ZERO40	SO	1,AOOR00	RESET ACCESS	10	06059	M %F0 08482 R
1894		BC81	*-16		7	06069	R 06059 2
1895		BA1	STACHK	BRCH ON ANY ERROR	7	06076	R 03105 G M
1896		SC	1,AOOR49	SEEK TO CYL 49	10	06083	M %F0 08537 R
1897		BC81	*-16		7	06093	R 06083 2
1898		BA1	STACHK	BRCH ON ANY ERROR	7	06100	R 03105 G M
1899	MEDIUM	SO	1,AOOR49		10	06107	M %F0 08537 R
1900		BCB1	*&15	BRCH BUSY	7	06117	R 06138 2
1901		BA1	STACHK	BRCH ON ANY ERROR	7	06124	R 03105 G M
1902		B	ONE1C		7	06131	J 06156
1903		A	LOOPTI,TIMCNT	ADD LOOP TIME TO	11	06138	A 08667 08673
1904		B	MEDIUM	TOTAL SEEK TIME	7	06149	J 06107
1905	ONE1C	A	CORR,TIMCNT	ADD CORRECTION	11	06156	A 08680 08673
1906		A	TIMCNT-3,AVGTME	ADD TIME TO AVERAGE ACC	11	06167	A 08670 08678
1907		S	TIMCNT		6	06178	S 08673
1908		A	@1@,RUTCNT	ADD 1 TO PASS COUNT	11	06184	A 08717 08653
1909		BZ	*&8	BRCH AFER 10 PASSES	7	06195	J 06209 V
1910		B	ZERO40		7	06202	J 06059
1911		SW	AVGTME-3		6	06209	. 08675
1912		MLNA	AVGTME-1,OUT50&20	MOVE AVERAGE TIME	12	06215	D 08677 07520 /
1913		CW	AVGTME-3		6	06227	¤ 08675
1914	NO7XIT	B	MONITR		7	06233	J 02101

TIME 110 MILLI SEC SEEKS CYL 0 TO CYL49

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION

```
PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
1916                       *** TEST ROUTINE DESCRIPTION ***
1917          THE ACCESS IS POSITIONED AT CYL 0,IT IS THEN SEEKED TO CYL 100,
1918          THIS IS FOLLOWED BY A SECOND SEEK TO CYL 100.THE BUSY LINE IS
1919          TIMED AND WHEN IT FALLS THE PROGRAM STORES THE TOTAL TIME BUSY
1920          WAS UP AND REPEATS THE ROUTINE.AFTER 10 PASSES THE AVERAGE TIME
1921          IS STORED AND THE PROGRAM PROGRESSES TO THE NEXT ROUTINE.ANY
1922          STATUS ERRORS WILL BE INDICATED.
1923
1924      A08         NOP                                          1  06240  N
1925                  DC      @08@              ROUTINE ID         2  06242
1926                  MLCB    ADDR00&1,ADR100&1                   12  06243  D 08483 08516 L
1927                  S       TIMCNT            RESET TIME COUNT   6  06255  S 08673
1928                  S       AVGTME            RESET COUNTERS     6  06261  S 08678
1929                  S       RUTCNT            RESET COUNTERS     6  06267  S 08653
1930      TO10C       SC      1,ADDR00          RESET ACCESS      10  06273  M %F0 08482 R
1931                  BCB1    *-16                                 7  06283  R 06273 2
                                                                                 G
1932                  BA1     STACHK            BRCH ON ANY ERROR  7  06290  R 03105 M
1933                  SC      1,ADR100          SEEK ACC TO CYL 100 10  06297  M %F0 08515 R
1934                  BCB1    *-16                                 7  06307  R 06297 2
                                                                                 G
1935                  BA1     STACHK            BRCH ON ANY ERROR  7  06314  R 03105 M
1936      LONG        SC      1,ADR1CO          TRY ANOTHER SEEK   10  06321  M %F0 08515 R
1937                  BCB1    *&15                                 7  06331  R 06352 2
                                                                                 G
1938                  BA1     STACHK            BRCH ON ANY ERROR  7  06338  R 03105 M
1939                  B       ONE85                                7  06345  J 06370
1940                  A       LOCPT1,TIMCNT     ADD LOOP TIME TO   11  06352  A 08667 08673
1941                  B       LONG                TOTAL SEEK TIME  7  06363  J 06321
1942      ONE85       A       CORR,TIMCNT       ADD CORRECTION     11  06370  A 08680 08673
1943                  A       TIMCNT-3,AVGTME   ADD TIME TO AVERAGE TIME ACC 11  06381  A 08670 08678
1944                  S       TIMCNT                               6  06392  S 08673
1945                  A       @1@,RUTCNT        ADD 1 TO PASS COUNT 11  06398  A 08717 08653
1946                  BZ      *&8               BRCH AFTER 10 PASSES 7  06409  J 06423 V
1947                  B       TO100                                7  06416  J 06273
1948                  Sw      AVGTME-3                             6  06423  , 08675
1949                  MLNA    AVGTME-1,OUT100&20 MOVE AVERAGE TIME 12  06429  D 08677 07559 /
1950                  Cw      AVGTME-3          P                  6  06441  ¤ 08675
1951      A08XIT      B       MONITR                               7  06447  J 02101
1952
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TIME 180 MILLI SEC SEEK CYL 0 TO 100

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION

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PGLIN     LABEL     OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION

1954          THIS ROUTINE AGAIN TIMES 50 MILLI SECOND SEEKS EXCEPT THAT THE
1955          ACCESS MOTION IS TIMED FROM CYL 9 OUTWARD TO CYL 0.AN AVERAGE OF
1956          10 SEEKS IS RECORDED.
1957
1958      NO9       NOP                                              1  06454  N
1959                DC     @09@              ROUTINE ID              2  06456
1960                MLCB   ADDR00&1,ADDR9&1                         12  06457  D 08483 08494 L
1961                S      TIMCNT            RESET TIME COUNT        6  06469  S 08673
1962                S      AVGTME            RESET COUNTERS          6  06475  S 08678
1963                S      RUTCNT                                    6  06481  S 08653
1964      NINE20    SC     1,ADDR9           POSITION ACCESS AT CYL 9 10  06487  M %F0 08493 R
1965                BC81   *-16                                      7  06497  R 06487 2
1966                BA1    STACHK            BRCH ON ANY ERROR       7  06504  R 03105 GM
1967                SC     1,ADDR00          SEEK ACC TO CYL 0       10  06511  M %F0 08482 R
1968                BC81   *-16                                      7  06521  R 06511 2
1969                BA1    STACHK            BRCH ON ANY ERROR       7  06528  R 03105 GM
1970      SMALL     SC     1,ADDR00          POSITION ACC AT CYL 0   10  06535  M %F0 08482 R
1971                BC81   *&15                                      7  06545  R 06566 2
1972                BA1    STACHK            BRCH ON ANY ERROR       7  06552  R 03105 GM
1973                B      FIVE0                                     7  06559  J 06584
1974                A      LOOPTI,TIMCNT     ADD LOOP TIME TO        11  06566  A 08667 08673
1975                B      SMALL              TOTAL SEEK TIME        7  06577  J 06535
1976      FIVE0     A      CORR,TIMCNT       ADD CORRECTION          11  06584  A 08680 08673
1977                A      TIMCNT-3,AVGTME   ADD TIME TO AVERAGE     11  06595  A 08670 08678
1978                S      TIMCNT                                    6  06606  S 08673
1979                A      @1@,RUTCNT        ADD 1 TO PASS COUNT     11  06612  A 08717 08653
1980                BZ     *&8               BRCH AFTER 10 PASSES    7  06623  J 06637 V
1981                B      NINE20                                    7  06630  J 06487
1982                SW     AVGTME-3                                  6  06637  , 08675
1983                MLNA   AVGTME-1,OFF10&20 MOVE AVERAGE TIME        12  06643  D 08677 07598 /
1984                CW     AVGTME-3                                  6  06655  ¤ 08675
1985      NO9XIT    B      MONITR                                    7  06661  J 02101
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

1987          AGAIN 120 MILLISEC SEEKS ARE TIMED,EXCEPT THE ACCESS MOTION IS
1988           OUTWARD FROM CYL 10 TO CYL 0 IN THIS ROUTINE.AN AVERAGE OF 10
1989          SEEK TIMES IS RECORDED.
1990
1991      N16       NOP                                                      1  06668  N
1992                CC      @16@                                             2  06670
1993                MLCB    ADDR00&1,ADDR10&1                               12  06671  D 08483 08505 L
1994                S       TIMCNT          RESET COUNTERS                   6  06683  S 08673
1995                S       AVGTME          RESET COUNTERS                   6  06689  S 08678
1996                S       RUTCNT          RESET COUNTERS                   6  06695  S 08653
1997      FROM10    SD      1,ADDR10        POSITION ACC AT CYL 10          10  06701  M %F0 08504 R
1998                BCB1    *-16                                             7  06711  R 06701 2G
1999                BA1     STACHK          REPORT ERRORS                    7  06718  R 03105 M
2000                SD      1,ADDR00        SEEK ACC TO CYL 0               10  06725  M %F0 08482 R
2001                BCB1    *-16                                             7  06735  R 06725 2G
2002                BA1     STACHK          REPORT ANY ERROR                 7  06742  R 03105 M
2003      TEN20     SD      1,ADDR00        SEEK ACC TO CYL 0               10  06749  M %F0 08482 R
2004                BCB1    *&15            BRCH ON BUSY                     7  06759  R 06780 2G
2005                BA1     STACHK          REPORT ANY ERRORS                7  06766  R 03105 M
2006                B       OUTTEN                                           7  06773  J 06798
2007                A       LOOPTI,TIMCNT   ADD LOOP TIME TO ACCUMULATOR    11  06780  A 08667 08673
2008                B       TEN20                                            7  06791  J 06749
2009      OUTTEN    A       CORR,TIMCNT     ADD CORRECTION FACTOR           11  06798  A 08680 08673
2010                A       TIMCNT-3,AVGTME ADD TIME TO AVERAGE TIME ACC    11  06809  A 08670 08678
2011                S       TIMCNT                                           6  06820  S 08673
2012                A       @1@,RUTCNT      ADD 1 TO PASS COUNTER           11  06826  A 08717 08653
2013                BZ      *&8             BRCH AFTER 10 PASSES             7  06837  J 06851 V
2014                B       FROM10                                           7  06844  J 06701
2015                SW      AVGTME-3                                         6  06851  , 08675
2016                MLNA    AVGTME-1,OFF11&20                               12  06857  D 08677 07637 /
2017                CW      AVGTME-3                                         6  06869  ¤ 08675
2018      N16XIT    B       MONITR                                           7  06875  J 02101
```

```
PGLIN   LABEL    OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2020          ACCESS MOTION IS TIMED FROM CYL 40 TO 0 IN THIS ROUTINE,AN AVER
2021        AGE OF 10 SEEKS IS RECORDED.
2022    N1C   NOP                                                1  06882  N
2023          DC       @1C@              ROUTINE ID              2  06884
2024          MLC8     ADDR00&1,ADDR49&1                        12  06885  D 08483 08538 L
2025          S        TIMCNT            RESET TIME COUNT        6  06897  S 08673
2026          S        AVGTME            RESET COUNTERS          6  06903  S 08678
2027          S        RUTCNT            RESET COUNTERS          6  06909  S 08653
2028    BACK40 SD      1,ADDR49          POSITION ACC AT CYL 40  10  06915  M %F0 08537 R
2029          BCB1     *-16                                      7  06925  R 06915 2 G
2030          BA1      STACHK            BRCH ON ANY ERROR       7  06932  R 03105 M
2031          SD       1,ADDR00          SEEK ACC TO CYL 0       10  06939  M %F0 08482 R
2032          BCB1     *-16                                      7  06949  R 06939 2 G
2033          BA1      STACHK            BRCH ON ANY ERROR       7  06956  R 03105 M
2034    BIG   SD       1,ADDR00          FORCE BUSY ON           10  06963  M %F0 08482 R
2035          BCB1     *&15              BRCH BUSY               7  06973  R 06994 2 G
2036          BA1      STACHK            BRCH ON ANY ERROR       7  06980  R 03105 M
2037          B        ONETEN                                    7  06987  J 07012
2038          A        LOCPTI,TIMCNT     ADD LOOP TIME TO        11  06994  A 08667 08673
2039          B        BIG                TOTAL SEEK TIME        7  07005  J 06963
2040    ONETEN A       CORR,TIMCNT       ADD CORRECTION          11  07012  A 08680 08673
2041          A        TIMCNT-3,AVGTME   ADD TIME TO AVERAGE TIME ACC  11  07023  A 08670 08678
2042          S        TIMCNT                                    6  07034  S 08673
2043          A        @1@,RUTCNT        ADD 1 TO PASS COUNTER   11  07040  A 08717 08653
2044          BZ       *&8               BRCH AFTER 10 PASSES    7  07051  J 07065 V
2045          B        BACK40                                    7  07058  J 06915
2046          SW       AVGTME-3                                  6  07065  , 08675
2047          MLNA     AVGTME-1,OFF50&20                         12  07071  D 08677 07676 /
2048          CW       AVGTME-3                                  6  07083  ¤ 08675
2049    N1CXIT B       MONITR                                    7  07089  J 02101
2050
```

```
PGLIN   LABEL     OPCOD  OPERAND                  COMMENTS                  CT  ADDRS  INSTRUCTION
2052              ACCESS MOTION IS TIMED FROM CYL 100 TO 0 IN THIS ROUTINE,AN AVER
2053              AGE OF 10 SEEKS IS RECORDED.
2054
2055    N11       NOP                                                        1  07096  N
2056              DC     @11@              ROUTINE ID                       2  07098
2057              MLC8   ADDR00&1,ADR100&1                                  12  07099  D 08483 08516 L
2058              S      TIMCNT            RESET TIME COUNT                 6  07111  S 08673
2059              S      AVGTME            RESET COUNTERS                   6  07117  S 08678
2060              S      RUTCNT            RESET COUNTERS                   6  07123  S 08653
2061    BAC1C0    SD     1,ADR100          POSITION ACC AT CYL 100         10  07129  M %F0 08515 R
2062              BC81   *-16                                               7  07139  R 07129 2
2063              BA1    STACHK            BRCH ON ANY ERROR                7  07146  R 03105 G M
2064              SD     1,ADDR00          SEEK TO CYL 000                 10  07153  M %F0 08482 R
2065              BC81   *-16                                               7  07163  R 07153 2
2066              BA1    STACHK            BRCH ON ANY ERROR                7  07170  R 03105 G M
2067    LARGE     SD     1,ADDR00          TRY AGAIN                       10  07177  M %F0 08482 R
2068              BC81   *&15              BRCH BUSY                        7  07187  R 07208 2
2069              BA1    STACHK            BRCH ON ANY ERROR                7  07194  R 03105 G M
2070              B      ONE80                                              7  07201  J 07226
2071              A      LOCPTI,TIMCNT     ADD LOOP TIME TO                11  07208  A 08667 08673
2072              B      LARGE              TOTAL SEEK TIME                 7  07219  J 07177
2073    ONE8C     A      CORR,TIMCNT       ADD CORRECTION                  11  07226  A 08680 08673
2074              A      TIMCNT-3,AVGTME   ADD TIME TO AVERAGE             11  07237  A 08670 08678
2075              S      TIMCNT                                             6  07248  S 08673
2076              A      @1@,RUTCNT        ADD 1 TO PASS COUNTER           11  07254  A 08717 08653
2077              BZ     *&8               BRCH AFTER 10 PASSES             7  07265  J 07279 V
2078              B      BAC100                                             7  07272  J 07129
2079              SW     AVGTME-3                                           6  07279  , 08675
2080              MLNA   AVGTME-1,OFF100&20 ADD AVERAGE TIME TO TYPE OUT   12  07285  D 08677 07715 /
2081              CW     AVGTME-3                                           6  07297  ¤ 08675
2082    N11XIT    B      MONITR                                             7  07303  J 02101
2083
```

TYPE SEEK TIME RESULTS

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2085			*** TEST ROUTINE DESCRIPTION ***			
2086			*** TYPE SEEK TIME RESULTS ***			
2087			USING THE RESULTS STORED BY THE SIX TIMING ROUTINES,A TABLE IS			
2088			COMPILED AND TYPED OUT.			
2089						
2090	N12	NOP		1	07310	N
2091		DC	@12@ ROUTINE ID	2	07312	
2092		B	TYP1	7	07313	J 01593
2093		DCW	@THE FOLLOWING ARE AVERAGE TIMES FOR TEN SEEKS@,G	45	07364	
2094		B	TYP1	7	07366	J 01593
2095		DCW	@SEEK FROM TC TIME WAS,SHOULD BE ^{L}BIN MSEC^{R}@,G	41	07413	
2096		B	TYP1	7	07415	J 01593
2097	OUT10	DCW	@ 0000 0360 50@,G	31	07422	
2098		B	TYP1	7	07454	J 01593
2099	OUT11	DCW	@ 0000 0400 120@,G	31	07461	
2100		B	TYP1	7	07493	J 01593
2101	OUT50	DCW	@ 0000 1600 120@,G	31	07500	
2102		B	TYP1	7	07532	J 01593
2103	OUT100	DCW	@ 0000 4000 180@,G	31	07539	
2104		B	TYP1	7	07571	J 01593
2105	OFF10	DCW	@ 0360 0000 50@,G	31	07578	
2106		B	TYP1	7	07610	J 01593
2107	OFF11	DCW	@ 0400 0000 120@,G	31	07617	
2108		B	TYP1	7	07649	J 01593
2109	OFF50	DCW	@ 1600 0000 120@,G	31	07656	
2110		B	TYP1	7	07688	J 01593
2111	OFF100	DCW	@ 4000 0000 180@,G	31	07695	
2112	N12XIT	B	MONITR	7	07727	J 02101
2113						

```
2115                    *** TEST ROUTINE DESCRIPTION ***
2116                    *** UPDATE CHANNEL & MODULE ROUTINE ***
2117          THIS ROUTINE STARTS WITH MODULE 0 ON CHANNEL 1 AND TESTS FOR A
2118          READY FILE,WHEN A READY FILE IS LOCATED THE PROGRAM IS ALTERED
2119          ACCORDING TO THE CHANNEL THE FILE IS ON.THE ROUTINE TYPES OUT THE
2120          MODULE AND CHANNEL NUMBER FOR EACH FILE FOUND READY.
2121
2122    N13   NOP
2123          DC    @13@              ROUTINE ID
2124          B     POP&7
2125          BCE   *&8,0&X1C,F       FILES ON THIS CHNL
2126          B     UPCHNL            GO UPDATE FOR NEXT
2127          MLCA  CODE3&X15,INCODE  MOVE CHANNEL CODES
2128          B     CHALTR            GO TO CHANNEL ALTER
2129          DCW   TOP               HIGH LIMIT
2130          DC    BOTTOM            LOW LIMIT
2131          DCW   @ @
2132          DC    @ @
2133    INCODE DC   @ @
2134    ROYFIL SD   1,ADDR00          SEEK THE ACCESS
2135          BNR1  *&15              BRCH NOT READY
2136          BA1   *&1
2137    POP   B     GOTIT
2138          A     @1@,ADDR00
2139          BCE   *&8,ADDR00,2      BRCH IF ACCESS ADDRESS IS 0
2140          B     ROYFIL
2141          S     ADDR00            RESET ACC ADDR
2142          SW    ADDR00&1
2143          A     @1@,ADDR00&1      UPDATE MOD ADDR
2144          BZ    *&8               BRCH IF TEN MOD TRIED
2145          B     ROYFIL
2146    UPCHNL A    &57@,X10          UPDATE
2147          A     @3@,X15           UPDATE IX 15
2148          CW    NUCHL&1
2149          BCE   ENDTST,X15-1,1    BRCH IF ALL CHANNELS TRIED
2150          B     N13&10            GO SEARCH FOR RDY MD
2151    GOTIT MLNS  ADDR00&1,RDYMSG&8 MOVE MOD ADDR
```

```
 1  07734  N
 2  07736
 7  07737  J 07826
12  07744  B 07763 00..0 F
 7  07756  J 07893
12  07763  D 08FH7 07794 T
 7  07775  J 01045
 5  07786  08330
 5  07791  03810
 1  07792
 1  07793
 1  07794
10  07795  M %F0 08482 R
 7  07805  R 07826 1
 7  07812  R 07819 M
 7  07819  J 07940
11  07826  A 08717 08482
12  07837  B 07856 08482 2
 7  07849  J 07795
 6  07856  S 08482
 6  07862  , 08483
11  07868  A 08717 08483
 7  07879  J 07893 V
 7  07886  J 07795
11  07893  A 08750 00074
11  07904  A 08723 00099
 6  07915  ¤ 03753
12  07921  B 08028 00098 1
 7  07933  J 07744
12  07940  D 08483 07991 1
```

UPDATE CHANNEL & MODULE ROUTINE


```
PGLIN     LABEL      OPCOD  OPERAND                                  CT  ADDRS  INSTRUCTION
2152                 MLNS   INCODE,RDYMSG&12   MOVE CHANNEL NUMBER  12  07952  D 07794 07995 1
2153                 MLNS   ADDR00,RDYMSG&18                         12  07964  D 08482 08001 1
2154                 B      TYP1                                      7  07976  J 01593
2155      RDYMSG     DCW    @TST MOD   CH  ACC  @,G                  19  07983
2156                 ZA     &N14,X3            LOAD IX 3             11  08003  M 08755 00039
2157                 B      0&X3                                      7  08014  J 000M0
2158      NIOEXIT    B      MONITR                                    7  08021  J 02101
```

```
PGLIN   LABEL   OPCOD  OPERANC                          CT  ADDRS  INSTRUCTION

2160            *** END TEST ROUTINE
2161    ENDTST  B      TYP1                              7  08028  J 01593
2162            DCW    @PASS@,G                          4  08038
2163            BCE    20C0,TA03,1      BRCH IF REPEATING 12  08040  B 02000 01003 1
2164            B      40C              GO TO LOADER     7  08052  J 00400
```

```
PGLIN     LABEL     OPCOD  OPERAND                                          CT  ADDRS  INSTRUCTION

2166          THIS ROUTINE ALLOWS THE CE TO SEEK BETWEEN ANY 2 ADDRESSES ON
2167        ANY ACCESS AND MODULE HE SELECTS.THE ROUTINE IS ENTERED BY ENTER
2168        ING 8 ON THE CONSOLE.THE ROUTINE IS LEFT BY PRESSING INQUIRY AND
2169        SELECTING ANY CONTROL OPTION.WHILE THE ROUTINE IS RUNNING THE
2170        SEEK TIME FROM THE SELECTED ADDRESS TO THE SELECTED ADDRESS IS
2171        RECORDED AND THE AVERAGE TIME IS TYPED OUT EVERY 100 PASSES.THIS
2172        SHOULD ALLOW THE CE TO MAKE ADJUSTMENTS USING THE PROGRAM AS THE
2173        TIMING TOOL.
2174
2175     N15        NCP                                                      1  08059  N
2176                DC      @15@                ROUTINE ID                   2  08061
2177                B       TYP2                GO REQUEST ADDRESSES         7  08062  J 01607
2178                DCW     @ENTER 16 DIGITS,8 DIGIT FROM ADDR AND 8 DIGIT TO @  49  08117
2179                DC      @ADDR@,G                                         4  08121
2180     SLTED      DCW     @                   @,G                          16  08138  Q
2181                ZA      &N15,X3             LOAD IX 3                    11  08140  M 08760 00039
2182                S       COUNT               RESET 100 COUNT               6  08151  S 08664
2183                S       AVGTME              RESET AVERAGE TIME COUMTER    6  08157  S 08678
2184     CNTEST     S       TIMCNT              RESET TIME ACCUMULATOR        6  08163  S 08673
2185                MLCA    SLTED-8,FRMADR&7    SET FROM ADDR SELECTED       12  08169  D 08130 08588 T
2186                MRCG    SLTED-7,TOADDR      SET TO ADDR SELECTED         12  08181  D 08131 08592 $
2187                SC      1,FRMADR            POSITION ACCESS AT FROM ADDR 10  08193  M %F0 08581 R
2188                BCBI    *-16                                              7  08203  R 08193 2
                                                                                        G
2189                BAI     STACHK              REPORT ANY ERROR              7  08210  R 03105 M
2190                SC      1,TOADDR            SEEK ACCESS TO THE TO ADDR   10  08217  M %F0 08592 R
2191                BCBI    *-16                                              7  08227  R 08217 2
                                                                                        G
2192                BAI     STACHK              REPORT ANY ERROR              7  08234  R 03105 M
2193     CTLDSK     SC      1,TOADDR            TEST ACCESS FOR BISY         10  08241  M %F0 08592 R
2194                BCBI    *&15                CHECK THE BUSY LINE           7  08251  R 08272 2
                                                                                        G
2195                BAI     STACHK                                            7  08258  R 03105 M
2196                B       CTLTME                                            7  08265  J 08290
2197                A       LOOPTI,TIMCNT       ADD LOOP TIME TO TIME ACC    11  08272  A 08667 08673
2198                B       CTLDSK                                            7  08283  J 08241
2199     CTLTME     A       CORR,TIMCNT         ADD CORRECTION FACTOR        11  08290  A 08680 08673
2200                A       TIMCNT-3,AVGTME     ADD TIME TO AVERAGE TIME ACC 11  08301  A 08670 08678
2201                A       @1@,COUNT           COUNT 100 PASSESS            11  08312  A 08717 08664
2202                BZ      *&8                                               7  08323  J 08337 V
```

```
PGLIN   LABEL    OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
22C3    TOP      B      CNTEST              GO TIME ANOTHER SEEK    7  08330  J 08163
22C4             MLNA   AVGTME-2,AVGMSG&25 MOVE AVERAGE SEEK TIME 12  08337  D 08676 08381 /
22C5             B      TYP1                                        7  08349  J 01593
22C6     AVGMSG  DCW    @AVERAGE TIME,100 SEEKS     MSEC@,G        31  08356
                                                                   Q
22C7     N15XIT  ZA     ENC4,X2                                    11  08388  M 08765 00034
22C8             BNQ    PRGCTL                                      7  08399  J 02273 Q
22C9             B      SLTED&2                                     7  08406  J 08140
```

```
PGLIN   LABEL   OPCOD  OPERAND                                    CT  ADDRS  INSTRUCTION
2211            *** PREPARE ONE INSTRUCTION LOOP ***
2212    PREP    B      TYP1                                        7  08413  J 01593
2213            DCW    @ONE INST. LOOP OPTION NOT AVAILABLE@      33  08454
2214            DC     @,TRY ANOTHER OPTION@.@                    19  08473
2215            B      PRGCTL                                      7  08475  J 02273
2216
```

RGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
2218		*** PROGRAM CONSTANTS ***					
2219	ADDR00	DCW	@000000088@,G	FILE	8	08482	
2220		DCW	@ @,G	ADDRESSES	1	08491	
2221	ADDR9	DCW	@000360088@,G	USED	8	08493	
2222		DCW	@ @,G	IN	1	08502	
2223	ADDR10	DCW	@000400088@,G		8	08504	
2224		DCW	@ @,G		1	08513	
2225	ADR100	DCW	@004000088@,G		8	08515	
2226		DCW	@ @,G		1	08524	
2227	ADR249	DCW	@009960088@,G		8	08526	
2228		DCW	@ @,G		1	08535	
2229	ADDR49	DCW	@001600088@,G		8	08537	
2230		DCW	@ @,G		1	08546	
2231	ADR125	DCW	@005000088@,G		8	08548	
2232		DCW	@ @,G		1	08557	
2233	ADR000	DCW	@000000000@,G		8	08559	
2234		DCW	@ @,G		1	08568	
2235	REZADR	DCW	@009880880@,G		8	08570	
2236		DCW	@ @,G		1	08579	
2237	FRMADR	DCW	@000000000@,G		8	08581	
2238		DCW	@ @,G		1	08590	
2239	TOADDR	DCW	@000000000@,G		8	08592	
2240		DCW	@ @,G		1	08601	
2241	ADRXXX	DCW	@000400880@,G		8	08603	
2242		DCW	@ @,G		1	08612	
2243	ADR250	DCW	@009#20880@,G		8	08614	
2244		DCW	@ @,G		1	08623	
2245	ADRYYY	DCW	@009880880@,G		8	08625	
2246		DCW	@ @,G		1	08634	
2247	VARIAD	DCW	@000000088@,G		8	08636	
2248	VARFLD	DCW	@000000000@,G		7	08645	
2249	RUTENT	DCW	@ @		1	08653	
2250	BLANK	DCW	@ @,G		4	08657	
2251	TOTIME	DCW	@ @		4	08662	
2252	COUNT	DCW	@ @		2	08664	
2253	LOOPTI	DCW	@000@		3	08667	
2254	TIMCNT	DCW	@0000000@		6	08673	

CONSTANTS

PGLIN	LABEL	OPCOD	OPERAND	CT	ADDRS	INSTRUCTION
2255	AVGTPE	DCW	@0C0002@	5	08678	
2256	CORR	DCW	@0C@	2	08680	
2257	MARKOT	DCW	@0C02@	3	08683	
2258	LNGCNT	DCW	@03@	1	08684	
2259	CODE3	DCW	@8P1@	3	08687	
2260		DCW	@0X2@	3	08690	
2261		DCW	@M33@	3	08693	
2262		DCW	@.14@	3	08696	
2263	LOCPX	DCW	@2C1@	3	08699	
2264	CORRX	DCW	@24@	2	08701	
2265	LOCPI	DCW	@316@	3	08704	
2266	CORRI	DCW	@66@	2	08706	
2267	LOCPC	DCW	@355@	3	08709	
2268	CORRC	DCW	@76@	2	08711	
2269		END	2000			J02000
2269			@N@	1	08712	
2269			@*@	1	08713	
2269			@C L@	1	08714	
2269			@G M@	1	08715	
2269			@ @	1	08716	
2269			@1@	1	08717	
2269			@0C209@	5	08722	
2269			@3@	1	08723	
2269			@7@	1	08724	
2269			@0C237@	5	08729	
2269			@2@	1	09730	
2269			@01332@	5	08735	
2269			@0C000@	5	08740	
2269			@0315@	4	08744	
2269			@7777@	4	08748	
2269			@57@	2	08750	
2269			N14	5	08755	03749
2269			N15	5	08760	08059
2269			N04	5	08765	04365

END OF ASSEMBLY

6.26.00 SUMMARY

26.01 System & Channel Cards

The System & Channel Cards are numbered
001 - System Card
002 thru 005 - Channel 1 thru Channel 4 in each of the DC series program decks.

26.02 Standard TADS 0-3

The Standard TADS for the "DC" Series are defined as follows:

Location		Not $\bar{1}$	$\bar{1}$
1000	TAD 0	Allow Error Typeout	Bypass Error Typeout
1001	TAD 1	Do Not Reg Action	Reg Action
1002	TAD 2	Not Used	Not Used
1003	TAD 3	One Prog. Pass	Repeat Prog.

The Standard TADS are set to $\bar{1}$ when the program is loaded.

26.03 Program Control Options

The following options are available in all the "DC" Series programs through the Console

Enter	To	Also Enter
0	Terminate Test	Nothing
1	Reset all Standard Tads	Four new Tads (1 or $\bar{1}$)
2	Alter Memory	Five Digit Memory Addr
3	Alter Routine Seq	Routine Numbers in order desired
4	Loop a Routine	Starting Address of Routine to be looped
5	Loop an instruction	See Package Write Up
6	Restart at desired loc.	Starting Memory Address
7	Continue from point of Inter.	Nothing

26.04 Auto Restart

If the Check Control Switch is set to Reset & Restart for any "DC" program it will automatically continue after a machine alarm.

26.05 Manual Restart

Press computer Reset & Start after any machine alarm or stop, the program will continue.

26.06 Loading Procedure

Reference Vol. 1 for Diagnostic Loading Procedures

26.07 Error Typeout Format

All error messages will be given on the typewriter in the following format.

A. "Routine N00" Defines failing routine number

B. "*Error 00 00000 M%F0 00000R 1248AB"

- "*Error" — Error Flag
- 00 — Error No.
- 00000 — Starting Addr of Rout
- M%F0 00000R — Failing Instr.
- 1248AB" — Status Ind.'s Found on

C. "Pertinent Data" Any valuable data

D. "Reg Error Action" Given if TAD 1 = 1
CE would now select any program control option desired.

26.08 DC01 Summary

A. Switch Settings Previous to Running
1. HAO On
2. All other 7631-1302 Switches Off

B. Special TAD 0 Loc 1004
1 Do not display failing Addr
1 Display failing Addr
Set to 1 when program is loaded.

C. Operating Requests
1. "Sel Mode"
CE selects mode and starting track Addr,
Enter " X 0000"

- X — Operating Mode
- 0000 — Starting Track *

Mode - Test Codes

Test \ Mode	Entire Mod	One Cyl	One Track	One Surface
Write HA1's & Verify	1	A	J	/
Verify Addr	2	B	K	S
Analyze Surface	3	C	L	T
Wrt HA1, Analyze, & Verify	4	D	M	U
Analyze & Verify	5	E	N	V

* NOTE: Starting Track Addr for Entire Module or One Cyl Mode must be Bottom Track of Cyl., for one Surface Addr must be that of the outer most track. For one track, address may be for any track.

2. "Test Acc 0 Mod 0 Ch 1"

Enter A 1 if Correct, A $\overline{1}$ otherwise

D. Flag-A-Track Option

The program will Flag A Track only at the CE's request.
To flag a track
1. Press Inquiry
2. Enter "8 0000 1"

3. Press Release
4. Flagging is complete when "Trck Flgd OK" Message is Typed. CE must then select another option.

26.09 DC02 Summary

A. Switch Settings.
1. HA0 on (On all 7631 to be tested)
2. All other 7631-1302 switches off
3. All 1302's not to be tested are set in op.

B. Special TAD 0 Loc 1004
   1̄ Do not run in Manual Mode
   1 Run in Manual Mode

C. Special Request (Manual Mode)
   1. "CYO Avail" Enter 1 if it is
      Enter 1̄ if it is not
   2. "CE-HAO ON"
      "Addr Read, 000000, CE-HAO OFF"
      Turn Switch On and then Off.
   3. "Comp Reset & Start"
      Press Computer Reset and Start.

D. Test Overlap - Files & Tapes
   To perform this test the program must be run in manual mode.

26.10 DC03 Summary

A. Switch Settings
   1. 1302 Mod 0, Acc 0 should be ready, all other access should be in op.
   2. HAO, CE-HAO, CE-TRK, and WRT FMT Switches on.
   3. Check control switch to reset and restart (1415)

B. Special Requests

   1. "Comp. Reset, Chk 7631"
      Press Computer reset and check condition of 7631, press start.
   2. "ACC 0 to CYL 000"
      "ACC 0 to CYL 110" Manual Mode
      "ACC 0 to CYL 194"
      Manually position access
   3. "# of Spare Heads"
      Enter number of heads available for alternate tracks
   4. "CE-HAO OFF"
      Turn off Switch press start

5. "CYO"
   Enter 1 if it is available
   Enter $\bar{1}$ if it is not

6. "Enter 1 if Mod 3 or 5 7631"
   Enter 1 is it is Mod 3 or 5
   Enter $\bar{1}$ if it is not

7. "HAO & WRT FMT SWS OFF"
   Turn off switches

8. "Write Inhibit and HAO Sws ON"
   Turn Switches ON

9. "Write Inhibit Off, HAO and CE HAO ON"
   Turn Switches Off and On Accordingly

10. "Pass, Sws Off"
    Test is complete, reset all switches
    and press start.

26.11 DC04 Summary

A. Switch Settings

1. HAO ON
2. Write Inhibit ON
3. All 1302 Access Set In op than are not to be tested

B. Special TAD 0, Loc 1004

$\bar{1}$ Do not display failing address
Do not take additional 20 min. warm up

1 Display failing address
Take additional 20 min. warm up

C. Select Seek Address

The CE may seek between any 2 addresses desired and get an average seek time for 100 seeks by

1. Press Inquiry
2. Enter "8"
3. Press Release

The program will request the CE to enter 8 Digit from and to Addresses. After these are entered the program seeks between the selected addresses.
This routine is left by

1. Pressing Inq
2. Enter 7
3. Press Release